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Electric Railway Journal

Consolidation of Street Railway Journal and Electric Railway Review

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HENRY W. BLAKE and HARRY L. BROWN, *Editors*

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Japan Can Be Assisted Through Red Cross Contributions

ELECTRIC railway men the world over will feel a special sympathy for Japan in its disaster. Tokyo is a city of many small homes and consequently of magnificent distances. This has necessitated an extensive transit system in the city, in addition to the electric interurban railway between Tokyo and the port of Yokohama, 17 miles away. The existence of extensive water powers in Japan has encouraged electrical development also throughout the empire. In consequence, Japanese railway engineers and transportation officials have become close students of what is the best practice in other countries, and many of them have gained many friends in Europe and America during visits to these continents.

Details are not available yet of the effect of the earthquake and fire on the transportation systems of Yokohama and Tokyo, but in such a widespread catastrophe they could not have escaped serious damage. The Red Cross has already set in motion relief measures, and readers of this paper cannot show their sympathy with Japan in a more practical way than by contributing to that fund.

Designing the Car to Speed Up Schedules

THAT increasing attention is being shown by operators to means for facilitating speedier operation of trolley cars is evidenced by the studies made in Chicago to analyze passenger movements in boarding and alighting from cars, as described in the issue of ELECTRIC RAILWAY JOURNAL for Aug. 25. These studies, involving an elaborate series of tests, were made in order to determine the relative advantages of the single-door versus the double-door safety car in facilitating the interchange movement of passengers. Out of this test also came a method for quickly determining the fitness of any type of car for the particular traffic on a given line.

With the increase of traffic of all kinds on busy city streets while street car business is simultaneously growing, studies of this character help in a constructive way to bring about the use of such cars as can handle the traffic presented, not only at the same speeds as heretofore in spite of increasing congestion, but at higher schedule speeds. It is significant that the schedules can be increased in ways such as this without any higher speed while in motion, and with the same motor capacity. The gain is entirely in eliminating time wasted in stops.

Although the time saving at each individual stop is small it is a great amount in the aggregate. If a car is making a schedule of 10 m.p.h. with ten stops per mile, the saving of but one second at each stop will give an increase of about 3 per cent in the schedule speed. In a railway system of considerable size it will be possible to utilize most of this gain, so that operating expenses can be reduced or service can be increased almost in proportion. And if the cars are designed right in the first place it can all be accomplished at no cost whatever.

Today, with the small margin that exists between income and outgo, careful attention to such factors as this is of vital importance, as the success of the industry depends on giving good and fast service at the lowest consistent cost. Other industries have been obliged to recognize changing conditions and have adapted themselves to keep in step. The street railway should in its function of a public utility continue to be a leader in this direction. In other words, the need to modernize was never so great as today.

Preparations to Combat Snow Are as Necessary as Ever

FEW people are aware of the frequency or real extent of the snowfall in their own locality. There is a widespread popular belief in many parts of the country that less snow falls now than was the case years ago. Some electric railway men even, who should have been disillusioned by bitter experience, share this belief. The prevalence of the idea that winters are less severe often tends to permit laxity here and there in taking adequate precautions to keep railway lines open. Here is a good place to practice thorough preparedness, and considerations of this matter are now in order, even though it may be 104 deg. in the shade on the day this issue of the JOURNAL reaches its readers.

Statements and figures of the United States Weather Bureau entirely contradict the theory of milder winters. Their records show that there is no outstanding trend either way. In fact, the seasonal snowfall is an extremely variable quantity. For example, the winter of 1918-1919 established a low record at New York. The very next winter, however, snowfall was far in excess of the average. At Philadelphia during the five-year period from the fall of 1913 to the spring of 1918 more snow fell than in any other similar period of which there is record.

The heaviest single winter known to the New York weather bureau was that of 1892-1893. On the other hand the ground was snow covered in 1919-1920 for a greater number of consecutive days than ever before. In New England the winter of 1915-1916 was the equal of many historic snowy ones. At Chicago 64 in. of snow fell in 1917-1918.

The lesson to be learned from these facts is that precautions to combat winter snow storms are as necessary as ever. Every railway needs an adequate equipment of plows and sweepers. Moreover, a comprehensive snow-fighting plan, such as is described elsewhere in this issue, is likely to prove of value. Auxiliary apparatus,

ice cutters, track scrapers, snow loaders, etc., have their places, too. Money spent to provide proper snow-fighting equipment will usually be saved by subsequent freedom from tie-ups.

Helping to Develop Buses on a Sound and Legitimate Basis

ELECTRIC railway men will be interested to note the respective policies of the several bus papers regarding the relation of different types of transportation, as indicated in the following quotations from their editorial pages.

Bus Transportation, discussing the New Jersey situation and the plan of settlement proposed by the railway, has this to say:

> Considering only the bus aspects of the plan, at its foundation is the recognition that transportation, like electricity and gas, to be sold most economically and with the greatest satisfaction to the user, must not be supplied by separate organizations under competitive conditions. *Bus Transportation* believes that only through proper co-ordination of bus and rail can the best interests of the public and of the two types of transportation be met.

Better Buses, the first issue of which has just recently appeared, states its policy in the first editorial as follows:

> We believe that the motor bus should be regarded as a major transit facility, rather than merely as a feeder to other modes of transportation, even though these have long served a useful purpose and are continuing thus to serve. . . . Highways are built for the public and should be open to every useful business undertaking. We join with those who see injustice in singling out motor bus lines for taxation, from which other commercial users of the public highways are exempt. . . .
>
> We do not expect that all will agree with this outline of policy. It must be admitted, however, that the views herein expressed reflect the opinion of the large majority of motor bus owners. Moreover, our attitude is such as will appeal to the spirit of fairness. This being so, those who now dissent from it must eventually yield.

National Taxicab and Motorbus Journal shows its knowledge of the past history and fundamentals of transportation this way:

> Where a responsible operator of a motorbus or motor freight line, or both, stands ready to render service between points now inadequately served by rail, or on the other hand, adequately served at a loss to the operating rail line, it is a fallacy absurd and uneconomic to refrain from granting the newer and cheaper form of transportation service permission to function.
>
> A few of the narrow-minded rails are constantly beclouding the issue with specious arguments of various kinds. By so doing they show themselves unable to rise to the occasion.
>
> Motor transportation has a long way to go before it will entirely supplant the rails, if ever it will. The narrow-minded element of the rail camp might well bear in mind that the rail and the motor vehicle are not attempting to crowd each other from the field of public patronage, but are agencies capable of developing side by side and of finding their own broadest field in joining resources for the perfecting of the public service of transportation. And this can be done as competitors—there is no need whatsoever of listening to the fallacy that transportation is a natural monopoly.

Bus Transportation has based its program on long experience and knowledge in the passenger transportation business, with full appreciation of the desirability and the necessity of encouraging new development to the fullest extent. During its almost two years of existence, it has made a consistent effort to spread the philosophy of co-ordinated rather than competitive services, and railway men should thus be able to appreciate the value of this paper to them, not only as a service to help them in their own bus enterprises but also as an exponent of sound bus development. And the paper is, for the same reason, of just as great service to the independent bus men, for the philosophy of co-ordination of buses with other transportation lines is best for bus as well as railway and is in fact the only sound basis on which bus men can develop their service if they hope to create a substantial business. It is just a matter of plain economics, provided a community does not choose to subsidize one form of transportation while penalizing the other.

It is increasingly evident, after all, that it is a good thing it was the McGraw-Hill Company that started *Bus Transportation,* and started it early, and made it easily the leading paper in its field.

Proper Assignment of Cars May Result in Large Economy

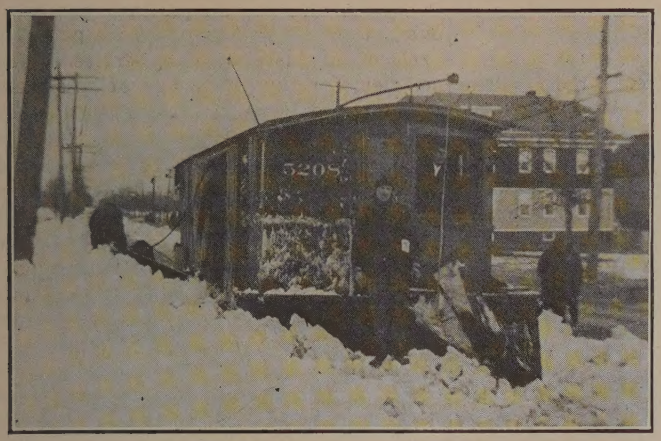
FOR best results the equipment on each street car route, or sometimes on a group of routes, should be uniform, for the speed of an entire line is determined by the slowest cars assigned to it. This speed may be determined by the characteristics of the motor equipment, or it may be fixed by the time taken at stops. Little argument is needed to show that cars capable of making a fast schedule should not be held down by those of slower types. Sometimes a line can be speeded up as much as 10 per cent in this way.

Car capacity is a second factor that merits consideration. The change from a car with a seating capacity of, say, thirty-nine to one with forty-four seats may make possible a lengthening of rush-hour headway from one and one-half to two minutes. Not only is a reduction in street congestion effected thereby, but the use of fewer cars in the rush hour makes the question of tripper runs less serious.

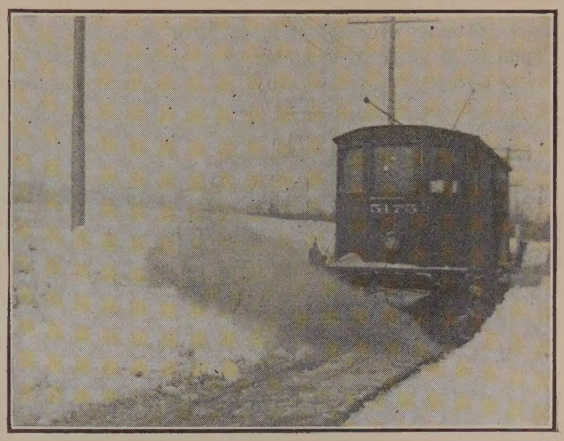
Another important feature of the car assignment problem is its reaction upon the public. Car riders notice the appearance, both interior and exterior, of the vehicles in which they ride every day. If the cars are all alike and the type is a reasonably satisfactory one, the regular patrons are likely to be satisfied. On the other hand, if four or five different types of cars are operated on a single line, this fact is noticed at once. Patrons are likely to think that the railway is operating "a lot of old junk" on their line. The presence of even a single car of unusual type, such as a car with longitudinal seats where cross-seats are customary, may seriously disturb the complacency of the regular riders.

Traffic conditions on different car lines seldom are exactly alike. The work of the traffic engineer should determine the characteristics of each route and obtain as much information as possible regarding its needs in the way of equipment. He will have to work in co-operation with the transportation and mechanical departments, of course, since many questions arise that must be settled by them. It is plain that there will be need for compromises, particularly when there are several types of cars to be used that have widely different characteristics.

While the traffic engineer usually can determine the type of car best suited to the service on any particular line, few railways having cars of differing ages and various designs will have a sufficient number of each available to equip each line with cars of the desired type. The fact that the ideal is impossible of attainment should not, however, deter the management from going as far as it can in that direction.



While the Storm Lasts Plows Are Used on the Suburban Lines



Sweeper Routes Are Shorter in This Kind of Territory

Fixed Snow Sweeper Routes Are Desirable

A Carefully Prearranged Plan to Combat Winter Storms Has Proved Its Worth on Many Occasions—Plows Are Used Also as Levelers—Scrapers on Cars Are a Help

SEVERAL years of experience with a comprehensive set of eighty-nine sweeper and twenty-six plow routes, covering the entire Public Service Railway system in New Jersey, has demonstrated the value of this method of handling the snow-fighting problem. The work of snow removal has been more efficiently performed, and delays and interruptions to service have been reduced in number because of the more frequent and more thorough clearing of snow from the tracks.

A set of snow-sweeper routes is made for each operating division, the number of routes depending upon the number of sweepers available, and the trackage of the division being divided into as many parts as there are routes. The mileages of the several routes are made approximately the same, but inequalities of length sometimes occur due to the character of the territory. Track in the open country where snow drifts deeply is likely to be more difficult to keep clear than is city track, and the sweeper routes should in such cases be made shorter. Less mileage may be assigned to an older and weaker machine, if that course appears to be desirable. No attempt is made to have the snow-sweeper routes coincide with routes used in actual passenger operation.

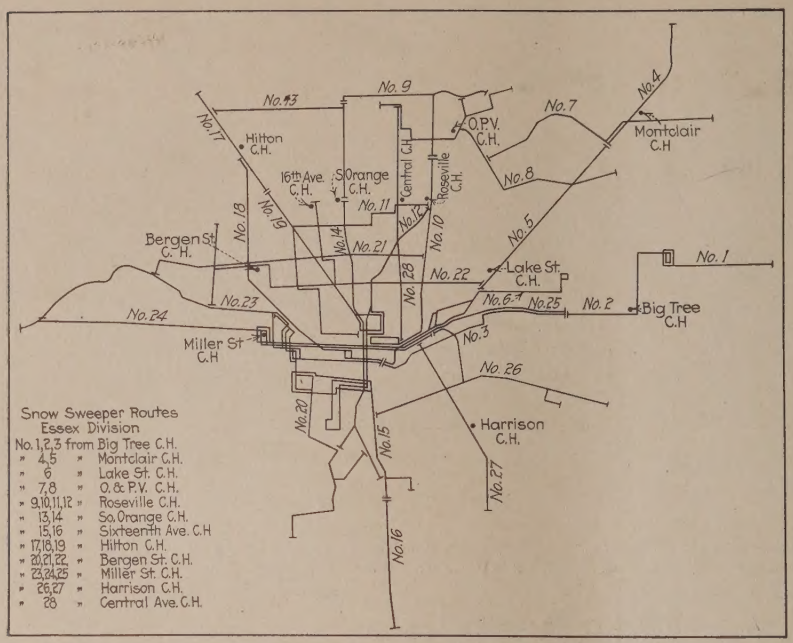
After all the trackage of the division has been assigned to the various sweepers, the routes are grouped together, each carhouse being made responsible for those in its particular vicinity. A table is then prepared showing the numbers of the routes, the names of the carhouses from which they operate, and an exact description of the track covered by each. The larger carhouses operate three or four sweeper routes, while the smaller carhouses operate only one or two.

Each sweeper has a definite section of line to keep clear. Routes overlap only in a few cases where that is necessary in order to reach a cross-over, loop or wye. When the sweepers first pull out of the carhouses a certain amount of duplication occurs when it is necessary for one machine to traverse the route of another in order to reach its own territory. This is reduced to a minimum, however, by having sweepers start out in opposite directions wherever the carhouse is located in the middle of a route. After a sweeper has reached its own route it remains on that and does not encroach upon the route of another sweeper except in case of emergency.

Several advantages have resulted from the adoption of this scheme. In the first place, all of the track is swept at regular intervals. In the center of the city, where several lines use the same street, there would be much unnecessary duplication of effort if a sweeper for each line covered the whole of that line including the portion in the city center. Moreover, there would be no way to control the time interval between sweepers on different routes, and the probability is that several sweepers would pass through the center of the city in rapid succession, after which a long time would elapse during which there would be no sweeping at all. But, by assigning the track in the center of the city to a single sweeper which does nothing but pass back and forth in that area, it is assured that this important part of the system will be swept at regular intervals and no undue accumulation of snow will occur to block the cars.

The elimination of duplication in the heart of the city makes it possible to give the suburbs more frequent sweeper service, because no time is wasted going over track that is already clear. The length of the average sweeper route is less than that of the ordinary operating line, and on this account it is easy for the division superintendent to keep track of his various units.

It is easy also to transfer a sweeper from one route to another. Blueprints of the table of snow-sweeper



Twenty-eight Sweeper Routes Are Laid Out According to This Plan with Little Duplication

routes are made up by the traffic department and posted in the cabs of all sweepers. Copies of this schedule are provided for the supervisor of each carhouse, the superintendent of the division, and the general superintendent. Instructions to the operators of snow sweepers provide that they shall telephone to their own carhouse immediately in case of breakdown, and always at the end of each half trip. The location of every sweeper at any given moment is therefore definitely known, and in case one machine becomes crippled it is necessary only to tell the crew of a machine on an adjacent route to cover also that of the crippled sweeper. They have in their own vehicle the same schedule of routes that the division superintendent has, and if they are told by number to cover a certain additional route, they need no further instructions, the details of the route being thoroughly explained on the blueprint. The control of the whole operation of snow fighting is therefore much more centralized than would be the case were each line operating its own sweeper independent of the others.

By assigning individual vehicles by number to certain fixed routes it becomes possible to regulate carefully the streets on which they are operated. In case of small clearance due to the presence of an overhead bridge or other obstruction, the danger of accidents resulting from too great sweeper roof height is eliminated by noting in a prominent position on the table that certain sweepers must not operate on certain routes.

To each sweeper is assigned a definite crew of trainmen. These same men operate the same vehicle over the same route in every storm. They therefore become thoroughly familiar with their sweeper and with the characteristics of the territory they cover. The whole procedure of starting the fight against snow is almost automatic. It is necessary only for the general superintendent to give the word that the sweepers shall go out. When this word reaches the carhouses each supervisor knows exactly what men and what sweepers he has to send out, and where they are to go. The men know the same thing and are prepared to commence their work at a moment's notice. No prolonged explanations are necessary in order to be sure that the entire line will be properly covered; that has already been taken care of in the preparation of the table.

Snow plows are assigned to routes in much the same way as are the sweepers. The former, however, have a dual function to perform. While the storm lasts they are used to clear the tracks out in the open country where deep drifts occur, as shown in the accompanying

ESSEX DIVISION

SWEEPER ROUTES
WINGS TO BE USED AT ALL TIMES

ROUTE NO.	SWEEPER NO.	
		BIG TREE
1	5192	FROM C.H NORTH TO MAIN & PASSAIC — RETURN TO GLENDALE LOOP —— COVER BETWEEN GLENDALE LOOP AND MAIN & PASSIAC
2	5181	FROM C.H NORTH TO GLENDALE LOOP —— RETURN TO CITY LINE — COVER BETWEEN CITY LINE AND GLENDALE LOOP
3	5169	FROM C.H SOUTH TO TERMINAL VIA PATERSON LINE — COVER BETWEEN TERMINAL AND CITY LINE VIA PATERSON LINE
		MONTCLAIR
4	5189	FROM C.H TO CALDWELL — RETURN TO ELM ST. — COVER BETWEEN ELM AND CALDWELL
5	5171	FROM C.H TO BLOOMFIELD & MT PROSPECT — RETURN TO ELM ST —— COVER BETWEEN ELM AND BLOOMFIELD & MT. PROS.
25	5112	FROM C.H NORTH VIA BROAD — BELLEVILLE TO CITY LINE BELLEVILLE —— RETURN TO C.H. REPEAT
		HARRISON
26	5194	FROM C.H TO 4TH & HARRISON THEN VIA 4TH - CENTRAL — CLAY — BROAD TO D.L & W LOOP. RETURN VIA SAME ROUTE TO 4TH & CENTRAL — THEN VIA KEARNY AVE TO ARLINGTON DEPOT —— RETURN TO KEARNY AVE THENCE TO BELLEVILLE PIKE —— RETURN VIA KEARNY —— 4TH TO 4TH & MARKET — RETURN TO 4TH & HARRISON —— REPEAT
27	5121	FROM C.H. TO BRIDGE & BROAD —— COVER BETWEEN BRIDGE & BROAD AND FIVE CORNERS JERSEY CITY
		CENTRAL
28	5190	FROM C.H. VIA CENTRAL AVE TO BROAD ST. (CROSSING BROAD) THEN VIA CENTRAL WASHINGTON TO SUBWAY ENTRANCE TO TERMINAL —— RETURN TO CENTRAL TO ORANGE —— RETURN TO C.H. - REPEAT

Typical Snow Sweeper Table

illustration. After the storm has ceased the snow plows are used as levelers to push back the snow from beside the track to a point near the gutter, thus making possible the passage of vehicles alongside the cars.

Accordingly there is made up a set of plow routes to cover the outlying districts, and also a set of leveler routes to cover all of the city lines. The number of plows in a division ordinarily is less than the number of sweepers, and each leveler must therefore cover more territory. To level the entire trackage of a division with four or five snow plows means that each one must follow a long and rather complicated route. These have been worked out to the best advantage in the preparation of the schedule, and are explained on the blueprint. There is no danger, therefore, that a plow will stray from its proper path, however long the route may be. All that is necessary is that the operator shall follow the route as described in the table.

As an auxiliary means of keeping the rails clear, the company has found that Root spring scrapers have been of particular value. Air-operated scrapers of this type have been installed on several hundred cars. Their use is usually optional with the individual motormen, although instructions may be given at the carhouse when it is specially desired to have the scrapers used.

Fighting 145 Inches of Snow

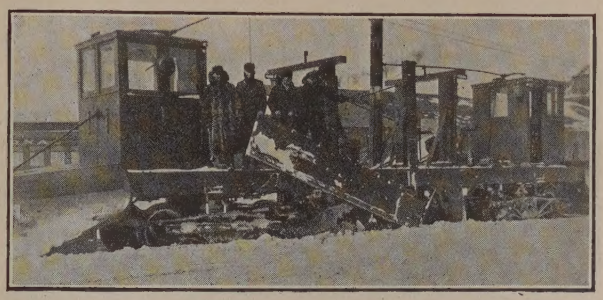
Levis, Que., Has a Combined Snow Plow and Ice Cutter that Assists Materially in Keeping the Track Open Despite Severe Weather Conditions

SNOW is always a problem in Levis, Que. While there is considerable snowfall every winter, last year the weather was especially severe, one storm succeeding another with just enough mild weather in between to compact the entire snowfall into a heavy mass hard to remove. During the winter season 145 in. of snow fell altogether, and the greater portion of it remained on the ground until spring.

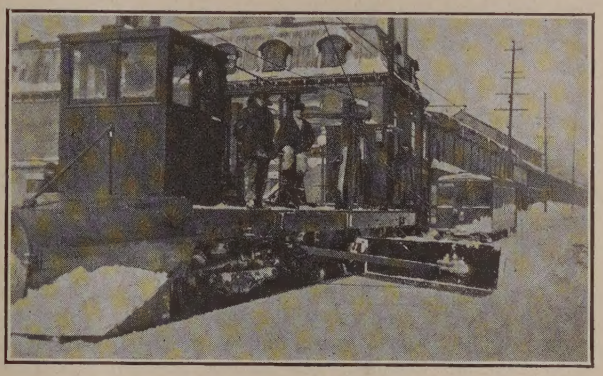
Much of the equipment used for snow fighting in Levis has been described in various issues of the ELECTRIC RAILWAY JOURNAL. Last year H. E. Weyman, general manager, added to his already complete equipment a new type of snow plow and ice cutter which proved particularly efficacious in dealing with the compacted snow and ice on the tracks. This plow, which is shown in the accompanying photographs, has a double mold board which throws the snow both ways—in Levis the lines are all single track—and in addition has an outboard plow which cleans a path about 10 ft. wide alongside the track.

The most novel feature of the outfit is the device for cutting ice. There are two cutters placed back to back for operation in either direction. Each unit consists of a V-shaped board under the center of the body and transverse to the direction of travel, on which is mounted a set of steel knives 6 in. wide. This cutter may be seen in the photograph of the plow with the outboard plow raised. This small size of knife was chosen to permit easy replacement in case of breakage, each one being a separate unit that can be removed independently.

The entire ice cutter may be raised or lowered by two air cylinders acting through the vertical pillars shown in the photographs. By this means the cutters can be placed in any position down to within approximately 1 in. above the level of the rail head. In order



The Outboard Plow Is Shown Raised. The Ice Cutter May Be Seen Beneath It



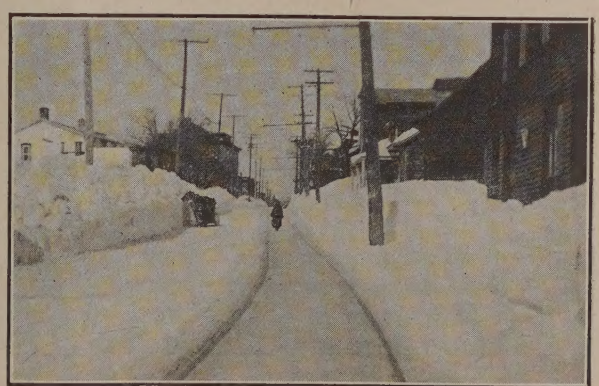
The Outboard Plow Is Here Shown in Position for Use

that there may be clearance outside of the track, and the paving will not be torn up, the cutters are raised slightly from the horizontal outside the rails.

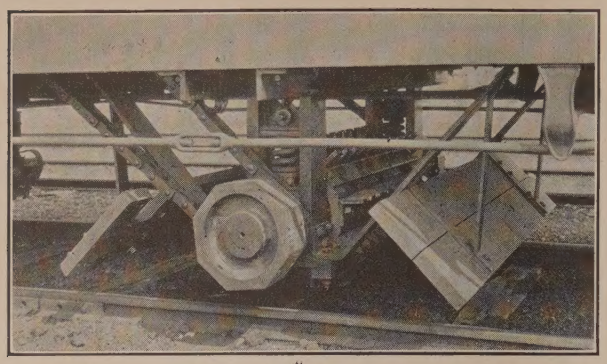
In action the plow can be driven by the motors at speeds up to approximately 15 m.p.h. The cutters are strong enough to clear away any thickness of ice that the machine can operate over. They are held in position by the air pressure, which gives a certain amount of flexibility, so that in the contingency that some extraordinary obstruction is encountered, the cutter will rise over it.

According to Mr. Weyman the plow has operated with great success, and it was found essential to keeping the line open under the abnormal conditions encountered. While the snowfall on the level was 145 in., the winds were severe a great deal of the time, so that the snow drifted in many places, reaching a depth of 15 to 20 ft. in the worst locations, which had to be cleared in order to open up a roadway for the cars.

The entire equipment was furnished by the Russell Car & Snow Plow Company, Ridgway, Pa.



The Main Street in Levis After It Had Been Cleared by the Plow and Ice Cutter



Only Interior Castings Have Teeth, as Rail Head Is Kept Clear by Plows and Sweepers

Revolving Teeth Cut Ice Between Rails

An Old Suburban Car Has Been Rebuilt at Erie—All Equipment Is Inside—Comfort of the Operator Is a Feature

THE damage to motor casings and other apparatus resulting from the presence of a hard ridge of ice between the rails is a familiar feature of winter operation. In the territory served by the Buffalo & Lake Erie Traction Company the danger of such an occurrence is especially prevalent because of the frequency and severity of the storms which sweep in from Lake Erie. For that reason the company has taken an old suburban car of obsolete type, completely dismantled the interior, and refitted it for winter service as an ice cutter.

Six hexagonal castings were pressed and keyed onto a shaft which is suspended under the center of the car. One casting is over each rail and four are between the rails. An angle iron with teeth cut in one flange is bolted parallel to the shaft on each face of the hexagonal castings. At present there are no teeth on the end castings because it has been found that the plows and sweepers keep the head of the rail itself free of ice.

The shaft is chain driven from a GE-87 motor inside the car body. A K-11 controller is used for this motor. The revolving shaft can be raised or lowered by a hand-operated worm gear, the lower limit bringing the teeth down to a level about 2 in. above the rail head. All equipment except the motors required to move the car, and the shaft itself, has been placed in the car interior. Air compressor, tanks, piping and wiring are inside, as shown in an accompanying illustration. The car is electrically heated and every effort has been made to have it comfortable for the men who must operate it, for it was felt that otherwise there would be a strong desire to pull the car into the carhouse before the work of ice cutting was thoroughly done.

Seasonal Snowfall Is Irregular

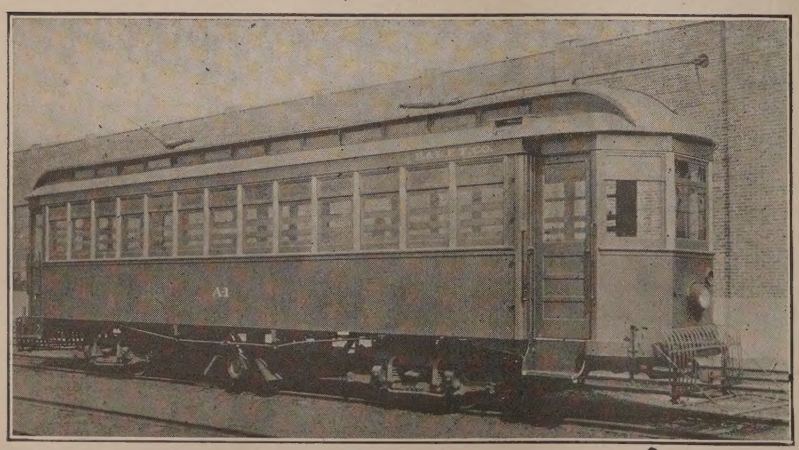
THE records of the U. S. Weather Bureau show that the annual snowfall varies in a most irregular manner. Sometimes there is an immediate reverse from a very light snowfall in one winter to a very heavy one the next. At other times there is a succession of winters with heavy snows or with light snows. The total snowfall by years for various localities is shown in the accompanying tables.

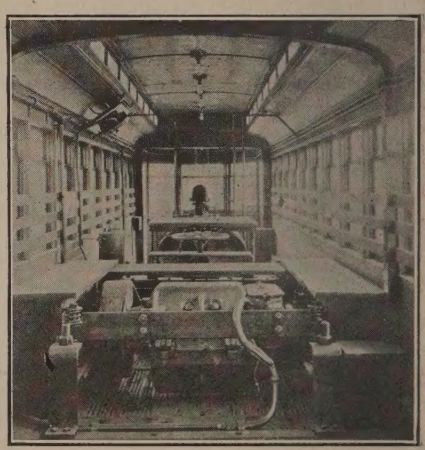
TABULATION OF SEASONAL SNOWFALL, IN INCHES

Winter	Philadelphia	New York	Winter	Philadelphia	New York	Winter	Philadelphia	New York
1885–86	20.2	23.9	1898–99	55.4	58.3	1910–11	28.5	26.0
1886–87	25.8	49.5	1899–1900	20.6	20.1	1911–12	22.5	23.3
1887–88	30.0	46.6	1900–01	10.6	9.2	1912–13	9.5	15.4
1888–89	6.2	21.9	1901–02	28.8	31.3	1913–14	33.1	37.1
1889–90	7.4	34.1	1902–03	16.8	26.0	1914–15	32.5	26.8
1890–91	15.2	39.7	1903–04	29.4	33.0	1915–16	31.1	47.3
1891–92	19.9	36.5	1904–05	43.8	57.8	1916–17	39.6	49.7
1892–93	36.8	77.6	1905–06	20.5	22.1	1917–18	38.9	32.3
1893–94	20.3	56.1	1906–07	38.6	52.4	1918–19	4.5	3.3
1894–95	22.8	36.2	1907–08	25.8	32.2	1919–20	23.2	45.6
1895–96	17.8	42.0	1908–09	20.2	20.7	1920–21	11.7	17.7
1896–97	25.7	39.1	1909–10	36.1	34.7	1921–22	28.0	27.2
1897–98	19.4	20.1						

Winter	Chicago, Ill.	Minneapolis, Minn.	Cleveland, Ohio	Boston, Mass.	Denver, Colo.	Buffalo, N. Y.	Washington, D. C.	Seattle, Wash.	Omaha, Neb.
1912–13	20.7	47.4	33.7	19.4	66.1	62.9	8.8	16.2	20.2
1913–14	27.9	23.0	60.3	39.4	98.9	90.9	28.6	1.1	17.6
1914–15	19.0	50.2	32.8	42.2	44.0	76.2	14.5	T.	51.5
1915–16	26.1	50.7	42.4	79.2	44.1	104.5	17.4	60.9	19.8
1916–17	23.7	84.9	50.0	54.2	79.4	86.8	18.3	16.0	22.9
1917–18	64.1	30.8	51.2	45.7	64.1	110.5	36.4	6.0	26.3
1918–19	28.7	26.7	8.8	21.1	46.3	25.0	3.3	T.	20.6
1919–20	32.2	64.5	41.0	73.4	71.3	69.4	16.4	3.9	31.7
1920–21	9.8	20.6	25.9	34.1	56.7	53.5	6.8	9.0	20.9
1921–22	11.5	43.3	26.8	37.2	54.4	39.8	44.5	12.9	11.4

Official figures furnished by the U. S. Weather Bureau, Washington, D. C.





Left—Car Converted Into Ice Cutter with Cutter Mounted Under the Center of the Car. Right—All Equipment Is Inside Car, Including Compressor, Air Tanks, All Wiring and Controller and Motor for Driving the Cutter

Keeping Track of Snow-Removal Costs

Montreal Tramways Engineering Department Supervises Snow-Removal Work in Co-operation with the Several Communities in Which the Company Operates — Company Divides Cost with the Municipalities

By R. B. Genest
Chief Clerk Engineering Department, Montreal Tramways

SINCE December, 1918, the responsibility for supervising snow-removal work done by municipalities served by the Montreal Tramways has been carried by the engineering department of the company. According to the contract in effect between the city of Montreal and the railway company, the latter is liable for one-half the cost of snow removal. Article 66 of the contract reads as follows: "The company shall, under instructions from the city, keep its track free from ice and snow, and the city may, at its option, remove the whole of such part of the ice and snow from curb to curb as it may see fit from any street or part of street in which cars are running, including the snow from the roofs of houses, thrown or falling into the street and that removed from the sidewalks into the streets, with the consent of the city, and the company shall be held to pay one-half of the cost thereof."

Regulations of a similar nature cover also the surrounding municipalities and suburbs of Outremont, Westmount, Montreal East, Verdun and Point-aux-Trembles. The company pays only one-third of the cost of snow removal in the town of Montreal West, which is a small suburb located on the western outskirts of the city.

Accounting System for Checking Bills

When the engineering department took over this work, it was necessary to build up an organization to handle it both in the field and at headquarters. In preparation for this, the officials of all the municipalities concerned were interviewed and a number of accounting systems were investigated. The co-operation of the municipal officials was obtained, and arrangements were made to standardize the methods of compiling bills.

Arrangements were made so that detailed accounts in duplicate would be forwarded weekly by the city, enabling the company to make a weekly audit and eliminating congestion at the end of the month or on the completion of the winter season.

The forms reproduced herewith were designed to supply the necessary information for checking the bills. The term "snow special" is inscribed on these forms, so as to distinguish them from forms used on other snow-removal work, such as the removal of snow from the track space by the operating department sweepers, and snow and wing plows, and the work done by the engineering department section gangs on surburban lines, in yards, on sidings, etc. Some details of these forms are given below:

Timekeeper's Weekly Report of Working Time. Fig. 1.—This form is used by the city of Montreal and the Montreal Tramways timekeepers to check all classes of labor employed by the city of Montreal on snow-removal work. It is made out daily and is used for auditing purposes. Each timekeeper makes out a time sheet, which is inclosed in a stiff back cover of the loose-leaf system. These time sheets are cross-checked and audited by representatives of both the city of Montreal and the Montreal Tramways, and unless the "hours" and "amounts" shown on each timekeeper's sheet check, the sheets are held up for investigation. The payroll is made up from these time sheets.

Checker's Daily Report on Snow Removal. Fig. 2.—This form is used on the city of Montreal snow-removal work, and is a summary of the information and charges contained in the preceding form. This form enables the Montreal Tramways to make a daily audit as to the daily cost and the cost to date, and is a check against the preceding form. The total amounts shown on the form must check with the total amount shown on a summary of the time sheets. (Fig. 1.)

Checker's Daily Report on Labor Involved in Snow Removal. Fig. 3.—This form was designed for the purpose of checking in detail the working forces employed daily. It enables the Montreal Tramways to ascertain the total number of men of each class employed, not only on the city of Montreal snow-removal work, but also on the work done by the surrounding municipalities. It enables the Montreal Tramways to make a comparison of working the forces employed between the current and previous seasons. It also enables the Montreal Tramways to prevent the employment of an unnecessary number of men, as the timekeepers and inspectors who cover the different districts are familiar with the work being done and are able to render intelligent opinions as to whether the number of men employed is sufficient or not.

Form Used for Keeping Time on Special Snow-Removal Jobs. Fig. 4—This form is used by the Montreal Tramways section gangs and extra forces, for the purpose of checking time expended on the removal of snow from switches, intersections, yards and sidings.

SNOW REMOVAL, CITY OF MONTREAL PROPER

Yearly Costs and Snow Precipitation

Season	Total	Snowfall, Inches	Cost per Inch
1906-1907	$136,750.19	150.5	$908.63
1907-1908	213,379.89	151.9	1,404.73
1908-1909	219,308.89	138.8	1,580.03
1909-1910	109,232.78	97.2	1,123.79
1910-1911	160,511.34	119.9	1,338.71
1911-1912	186,617.07	107.5	1,735.97
1912-1913	131,497.07	102.5	1,282.89
1913-1914	204,777.26	105.9	1,933.68
1914-1915	151,845.39	86.6	1,753.41
1915-1916	256,366.15	103.2	2,484.16
1916-1917	310,309.06	105.3	2,946.90
1917-1918	328,366.32	129.6	2,533.69
1918-1919	213,257.89	104.6	2,038.79
1919-1920	304,980.72	109.2	2,792.86
1920-1921	198,012.81	61.4	3,224.96
1921-1922	212,714.80	80.6	2,639.14
Total	$3,337,927.65	1,754.7	$31,722.34
Average per season	208,620.47	109.7	1,982.64
Maximum	328,366.32	151.9	3,224.96
Minimum	109,232.78	61.4	908.63
Cost per street mile, 1921-1922,		$2,352.59	

Its initial purpose is to accumulate the costs of this particular section of the snow-removal work and is made out daily by the divisional roadmasters' clerks.

DATA GRAVITATE TO CENTRAL OFFICE

The system centers in the head timekeeper's office, where a large ledger is maintained. In this the distribution of snow-removal expenditure is entered daily, showing cumulative costs.

The following instructions to timekeepers will indicate the routine followed in the field:

SNOW SPECIAL
INSTRUCTIONS TO TIMEKEEPERS

The following are the instructions to be followed out by all timekeepers for the season 1922-23:

Montreal East and Pointe-aux-Trembles will get in touch with the timekeepers or representatives of the said cities and municipalities and obtain as much information as possible as to the location and number of men working, also the nature of the work being done.

All timekeepers, in the interest of the work in hand, must report immediately in writing any irregularities in connection with time, loading and size of snow boxes, distribution of men, etc.

Transportation tickets supplied to Montreal Tramways timekeepers are for their use only.

In the event of the absence from work of any timekeeper for a legitimate reason, it is necessary to notify the traveling checker several hours ahead of time so that arrangements can be made to provide a substitute.

Under no consideration whatsoever must any leniency be shown in connection with time.

A working day will consist of ten hours—from 7 a.m. to 6 p.m.—plus the regular allowance for overtime and Sunday work.

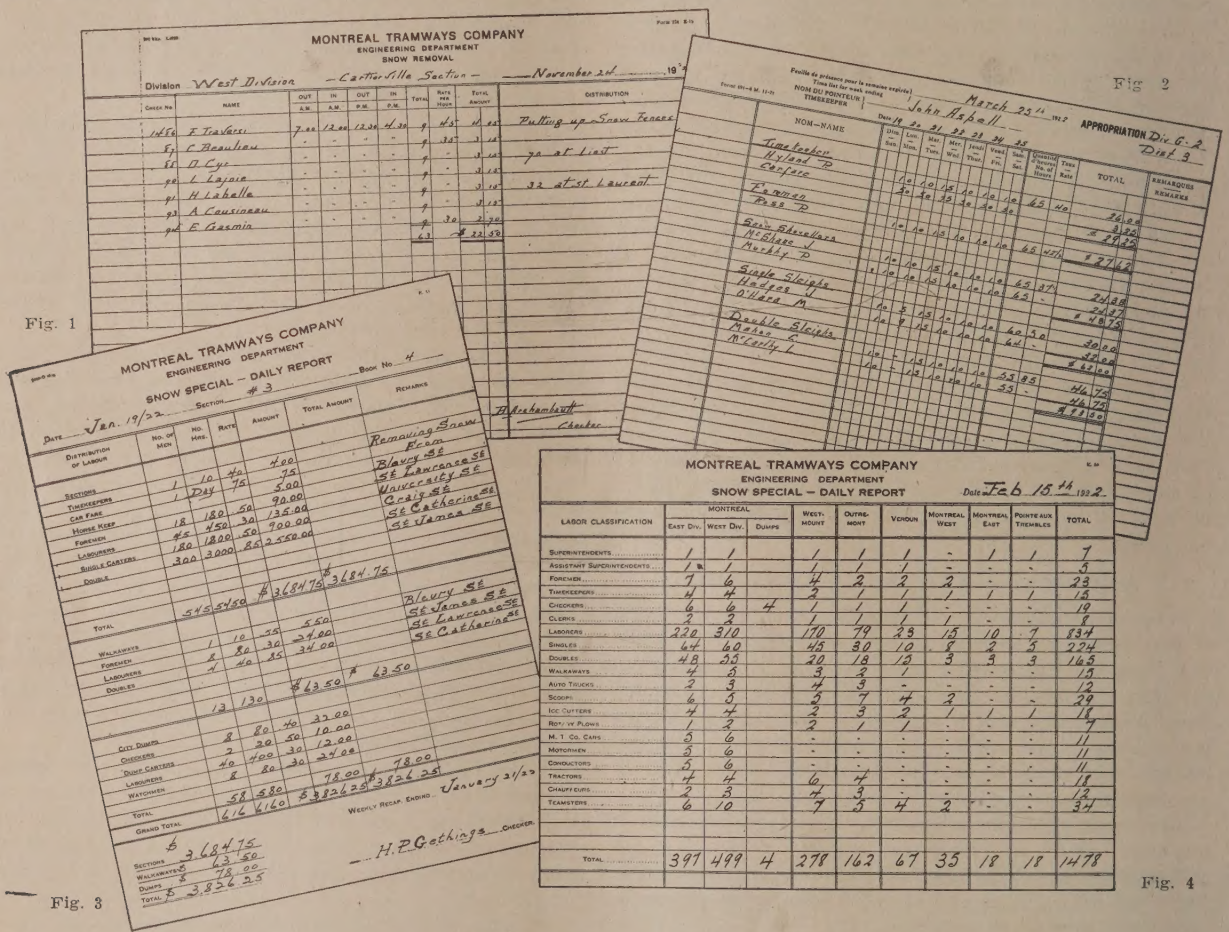


Fig. 1 Fig. 2 Fig. 3 Fig. 4

Fig. 1—Checker's Daily Report on Snow Removal. Fig. 2—Timekeeper's Weekly Report of Working Time. Fig. 3—Checker's Daily Report on Labor Involved in Snow Removal. Fig. 4—Form Used for Keeping Time on Special Snow Removal Jobs.

Montreal Tramway Company's timekeepers will meet city of Montreal timekeepers daily, at a starting point on each of the eight city sections convenient to both representatives.

Each timekeeper will cover his district and report at the City Hall at 9:30 a.m. for verification of time sheets.

Timekeepers will again cover districts in the afternoon and report at 4:30 or 5 o'clock at Room No. 207, Royal Trust Building, to make out daily district reports to be handed in to traveling checker when completed.

Montreal Tramways snow special timekeepers will be subject to the same rules and regulations as construction timekeepers.

Timekeepers should be at the starting point on each district not later than 7:15 a.m. in order to cover the ground before reporting at the City Hall.

Timekeepers working in the cities of Westmount, Outremont and Verdun and the municipalities of Montreal West, Montreal East and Pointe-aux-Trembles will get in touch with the timekeepers or representatives of the said cities and municipalities and obtain as much information as possible as to the location and number of men working, also the nature of the work being done.

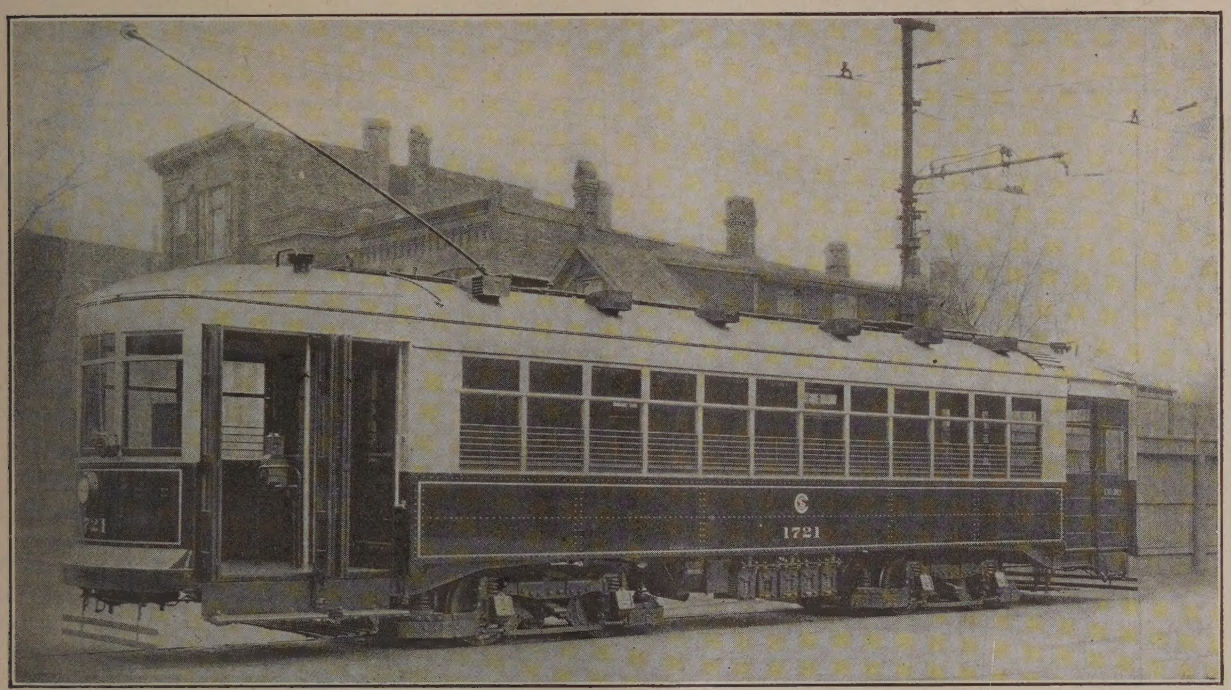
All time sheets must be audited under the supervision of the traveling checker.

All weekly accounts from municipalities must be checked in detail against Montreal Tramways timekeepers' daily time sheets and weekly recapitulation on the form head—"Snow Special Daily Report."

The accompanying table gives a summary of yearly costs and snow precipitation in the city of Montreal. These indicate that snow removal is considerable of a problem in Montreal. It is interesting to note from these figures that the cost is not directly proportional to the amount of snowfall, because wind, rain, the rise and fall of temperature and the amount of sunshine were contributing factors.

Chicago's Motor Car for Train Service

A Substantial Structure Has Been Combined with a Pleasing Finish and Appearance—Designed by the Railway for Hauling Trailers in All-Day Service—Uniformity in Cars Built by the Company and the Car Builders Reduces the Number of Parts to Be Carried in Stock



Note Streamlines in Body Design of New Chicago Cars for Hauling Trailers All Day

THE first of 169 new motor cars are now being put into service by the Chicago Surface Lines. Of this order, sixty-nine are under construction at the West shops of the company, seventy more are being built in the J. G. Brill plant at Philadelphia, and the remaining thirty are being built by the McGuire-Cummings Company.

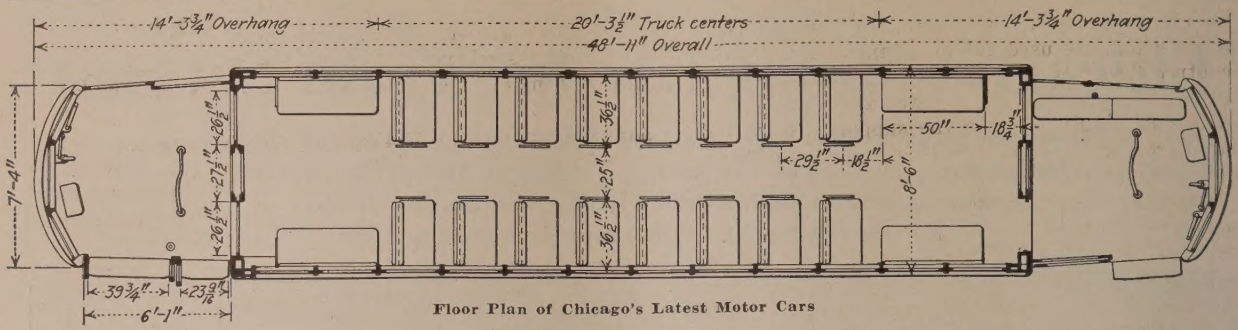
The Surface Lines has in the past designed and built a number of cars at its own West shops, among them being the double-truck "automatic door" one-man car. The company is, therefore, familiar with the problems which confront manufacturer and car builder. The car building capacity of the shop, which is about one car a day, was found to be insufficient to handle this entire order, so it was split into three parts, in such a way that each part will be completed at approximately the same date.

To have identical in construction the cars built in three different shops ordinarily is a difficult problem. It was successfully solved by the engineering division of the shops and equipment department under the direction of H. H. Adams. After the general design of the car had been decided upon a complete set of working drawings was made and duplicates furnished to the two car builders, so that when the cars are finished and delivered they will be exactly alike. By doing the detail design work the Surface Lines was able to utilize many existing standard parts in the new cars and thus avoid making a large number of new patterns. This results also in the elimination of duplicate stock parts, a saving which in itself quickly absorbs the entire cost of preparing the additional drawings.

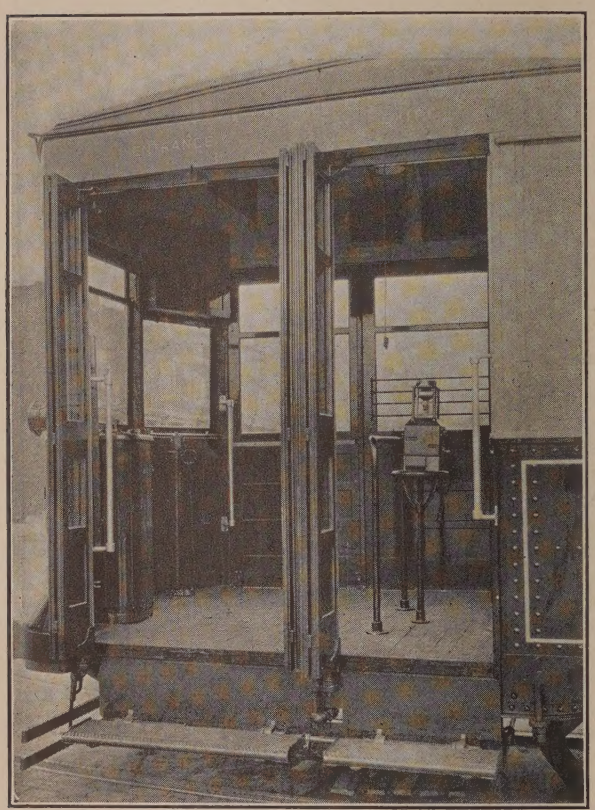
The car is of the double-end type and corresponds in general appearance to the arch roof cars in service on the Surface Lines. Streamline effect, together with the careful selection of finish and trimming, has resulted in a pleasing appearance. The company's new standard color scheme has been used, which is red below the belt rail and cream color above. The interior finish of the car is cherry with a buff ceiling, which gives approximately 80 per cent of the reflection of ivory white and is considerably more economical to maintain.

Ruggedness is the outstanding feature of the car, each part being so built that it will stand up with minimum maintenance under heavy city service requirements. Study of the distribution of weight among the various parts has resulted in a car weighing 46,900 lb., which is 8,500 lb. less than the present cars used for trailer service. The latter has sufficient capacity to haul a trailer during the rush period, but the new car has been designed to haul a trailer all day if necessary. The equipment consists of four GE-275 motors with K-35 control, provided with line switches interlocked with the doors. The motors are mounted on Brill 51-E trucks with 28-in. wheels. All parts were specified to be of American Electric Railway Engineering Association standard as far as possible.

In order to insure freedom from electrical troubles



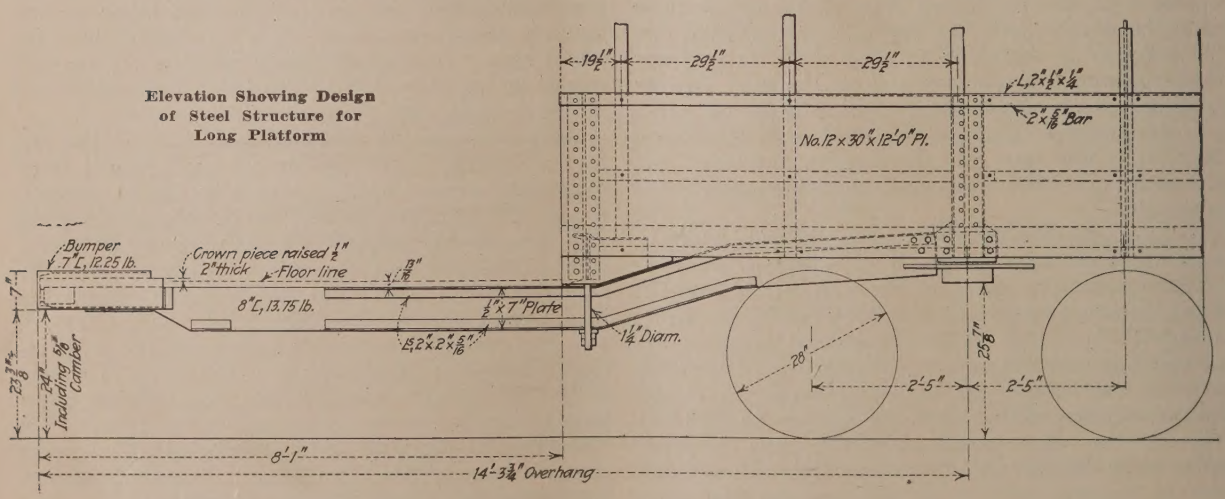
Floor Plan of Chicago's Latest Motor Cars



Platform, Door and Step Arrangement—Aluminum Grab Handles Are Used

Head-On View Shows Fender, Sign, Headlight and Trolley Catcher Equipment

Elevation Showing Design of Steel Structure for Long Platform



due to creepage around the standard type porcelain insulators which are used for mounting the line switch and control rheostats, a system of double insulation is used; i.e., the apparatus is insulated from its supports by one set of insulators, and the supports in turn are insulated from the car frame either by a second set of porcelain insulators or by hard maple mounting strips. This method of mounting the apparatus is shown in an accompanying illustration.

The rear doors are of the folding type and are equipped with National Pneumatic door engines. They are operated simultaneously by a single engine located above the door header. The conductor's control of the valve is mechanical. The front right-hand door is of the sliding type, being operated manually by the motorman. Curtains are so mounted that they are exposed when rolled up and, therefore, are easy to clean. The Surface Lines' standard system of ventilation, manufactured by the Railway Utility Company, is employed. Automatically regulated intakes are located at the four corners of the car body, with eight exhaust ventilators placed between on the roof. Two ventilators are provided for each platform.

The middle part of the car has sixteen reversible cross-seats manufactured by the J. G. Brill Company, with full spring cushions and thin type backs. They are rattan covered. The width from the inside lining over the aisle plate is 36½ in., and the seat cushions measure 17 in. x 34 in. Longitudinal seats accommodating three persons each are placed in the ends of the body. A folding seat for four persons is provided on the front platform at the left side of the car, making a total seating capacity of forty-eight. The platform layout is of the "pay-as-you-enter" type, which is standard on cars of this company.

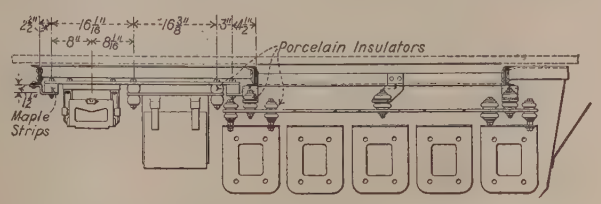
The general dimensions of the car are shown in the accompanying table.

PRINCIPAL DIMENSIONS OF CHICAGO CAR

Length over bumpers	48 ft. 11 in.
Length over corner posts	32 ft. 9 in.
Width over all	8 ft. 6 in.
Seating capacity (body)	44
Seating capacity (platform)	4
Total seats	48
Width of aisle	25 in.
Door opening in clear (rear entrance)	3 ft. 3¾ in.
Door opening in clear (rear exit)	1 ft. 11 5/16 in.
Door opening in clear (front exit)	2 ft. 5½ in.
Height, rail to trolley boards	11 ft. 7½ in.
Height, rail to floor	3 ft. 1½ in.
Height, rail to side sill	2 ft. 7½ in.
Height, rail to step	15⅝ in.
Height, step to platform	13 7/16 in.
Height, platform to body floor	9 7/16 in.
Side post centers	29½ in.
Wheelbase of truck	4 ft. 10 in.

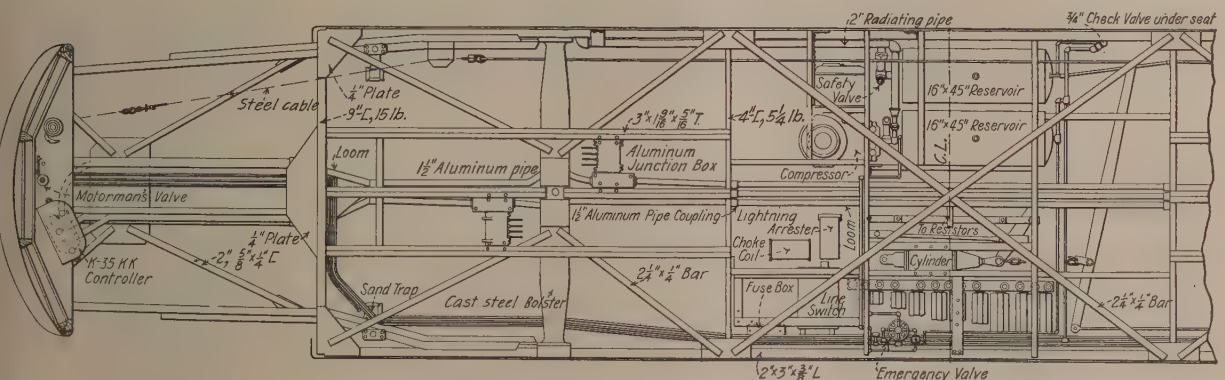
The plate girders forming the sides of the car are of 12-gage steel reinforced at the lower edge with 3-in. x 2-in. x ⅜-in. angles and at the top edge, under the belt rail, with 2-in. x 1½-in. x ¼-in. angles and a 2-in. x 5/16-in. bar. The girder is further strengthened with 1½-in. x 1½-in. x ⅛-in. seat support angles placed longitudinally half way between its bottom and top edges and cut for the side posts, which are strapped and bolted to the plate girder.

The platform knees are 8-in. 13.75-lb. channels, reinforced at the point of greatest stress by web plates and angles. Bumpers are of 7-in. 12¼-lb. channel, with the flanges turned in. The end sills consist of 9-in. 15-lb. channels secured to the side structure with gusset plates. Channels are used for the main body cross sills, being of 4-in. 5¼-lb. section. The frame is braced from bolster to bolster with continuous diagonal braces of 2½-in. x ¼-in. flat bar. Further diagonal bracing is installed between the bolster and the end sills. Bolster struts on the side girder are made of two angles riveted together to form a "Z" section, and are fastened to the bolster by turned bolts with a driving fit. The trapdoor openings are framed with 3-in. x 3-in. x 5/16-in. tees, having the vertical stem cut to 1 5/16-in. and run longitudinally either side of the steel bolster.



Double Sets of Porcelain Insulators for Rheostat Supports

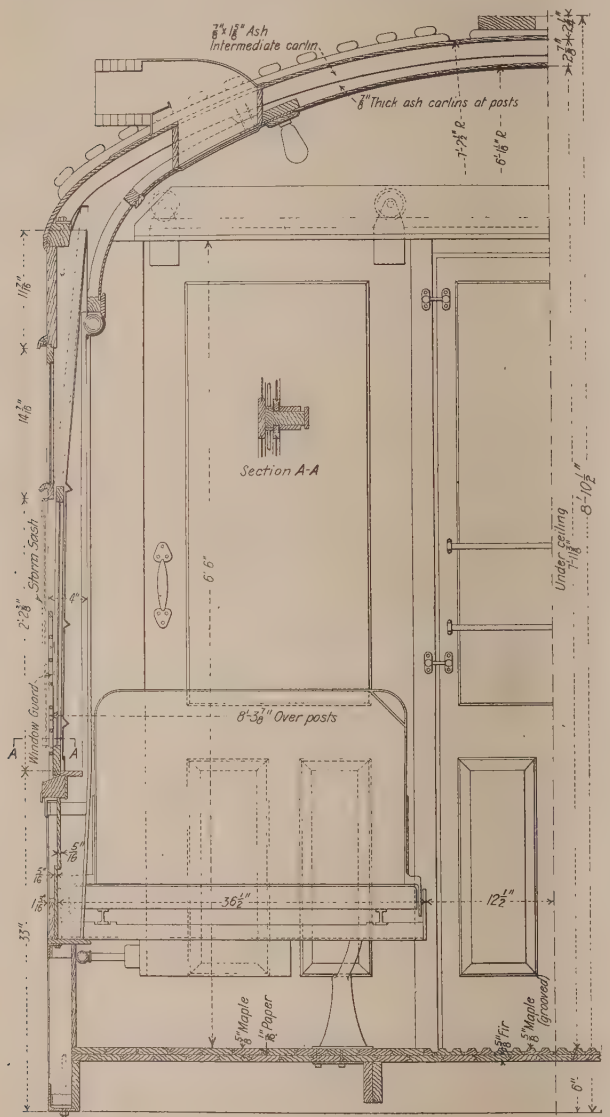
The roof is supported on ⅜-in. x 1½-in. steel carlins set on edge and bolted to 1¼-in. ash carlins over each pair of side posts. Intermediate carlins of 1¼-in. x 1⅝-in. ash are provided between the posts. The roof is ⅜-in. tongued and grooved poplar, covered with No. 8 National prepared roofing. The headlining is ¼-in. Agasote in the center and 5/16-in. Agasote at the sides. Special spring clips for holding the ceiling signs are provided at each end of the car, in the manner standard on the Chicago Surface Lines. Two continuous wood purlins are installed, to which the body lamp sockets are fastened directly by means of special Benjamin mounting plates. The ash side posts are reinforced with ⅜-in. rods, bolted to the lower girder angle, and extending upward through the feet of the steel carlins.



Outline of Steel Frame and Location of Principal Equipment

The body side top plate is of yellow pine, and the letterboards are of $\frac{7}{8}$-in. poplar.

The top sash is continuous, $1\frac{1}{4}$ in. thick, and is fastened to the outside of the side posts. The lower rail of the top sash is provided with a lip, to receive the top of the storm sash. These are made up in two-window sections and are of $\frac{5}{8}$-in. thick cherry, fastened to the side posts. The lower side sash are also of $\frac{5}{8}$-in. cherry, provided with brass wearing channels on the stiles and are arranged to lift. O. M. Edwards sash



Cross-Section Through Car

fixtures are used, with a lock on the right-hand side of each sash and a compression brake on the opposite side.

The window guards are made up of No. 18 gage brass tubing of $\frac{3}{8}$ in. inside diameter. These, however, are made up in a single-window section and are fastened permanently between side posts. By this arrangement they form an integral part of the car structure and add materially to the stiffness of the side frame, and the storm sash can be applied without removing them.

The double floor consists of two $\frac{5}{8}$-in. thicknesses. The lower is of fir and the upper of maple, separated by tarred felt. In the aisle the top floor is rabbeted, so as to eliminate the use of separate floor strips.

WEIGHTS OF PRINCIPAL DETAILS OF CHICAGO CAR

Body (less electrical equipment)	20,735 lb.
Control and wiring	2,025 lb.
Two trucks complete No. 51-E Brill	14,500 lb.
Motors with pinions, gears, gear cases, axle collars and axle bearings	9,640 lb.
Total light weight	46,900 lb.

In accordance with recent Surface Lines practice, the stationary platform stanchions are of aluminum. In addition to these, the vestibule grab handles are of aluminum pipe, with end castings of special aluminum composition. The use of this material effects not only a saving in weight but also an improvement in the appearance of the vestibule.

Every effort has been made to keep down the weight of the car without weakening its structure. The control wiring has been placed in Duraduct except where it passes under the trapdoor openings, where it is inclosed in aluminum conduit. Aluminum junction boxes are provided for the motor leads. All auxiliary wiring under the body floor is in aluminum conduit, as is also the heater wiring along the truss planks. Auxiliary wiring above the flooring is in Duraduct.

The accompanying table shows the distribution of weight.

Refund Check Avoids Disputes

WHERE fare boxes are used, a passenger occasionally drops more than the required amount of money into the box. While this may be detected while the coins are lying on the table in the fare box, the conductor has no means by which he can extract the coins and give them back to the passenger. Usually, the conductor directs the passenger to apply to the company's offices for a refund.

On the lines of the Beaver Valley Traction Company, New Brighton, Pa., disputes of this character have been eliminated entirely by the use of the refund check illustrated. In case the passenger deposits more than the correct fare, he can receive the difference back at once, upon application to the conductor, provided he signs the refund check. In this way he has no further complaint to make to the company. The signature will deter the passenger from making a fraudulent claim.

REFUND CHECK

Operator .....
Amount Deposited .....
Amount of Fare .....
Amount Refunded .....
Signature of Passenger .....
Date .....

Route	Date	192
Car Operated	Fare Box No.	Car No.
From M.		
To M.		
Badge		
Name		

At Top, Conductor's Receipt for Refund. At Bottom, Credit Slip Dropped in Fare Box

The conductor has the signature of the passenger on the refund check to show that he has paid out money. This check is turned in along with the daily trip sheet.

In order that the cash in the locked fare box will be kept straight with the conductor's record, and that he will get the refund, he fills out another small form, as shown, and drops it in the fare box.

No bookkeeping is involved, as the refund check and the credit slip deposited in the fare box take care of the overpayment automatically. The passengers are much better satisfied with the arrangement than when it was necessary for them to apply at the company's office for refund.

Securing a Favorable Insurance Rate

On Chattanooga Property Single Broker Acts as Intermediary Between Utility and Underwriters, Thus Simplifying Procedure and Providing for Equitable Distribution of Risk

By W. C. Campbell
Assistant to the Vice-President,
Tennessee Electric Power Company, Chattanooga, Tenn.

THE rate fixed upon a piece of property by an inspection bureau of the fire underwriters is the best index we have of the probability of a fire loss. At the same time no public utility can be fully compensated for the loss occasioned by a severe fire by money collected on its fire insurance policy. The financial houses handling the company's securities not only want to know that the property is insured, but are favorably impressed with a low rate. This, like the clean shop, low lubrication cost, orderly store room and good accident damage record, is commonly considered an indication of general good management.

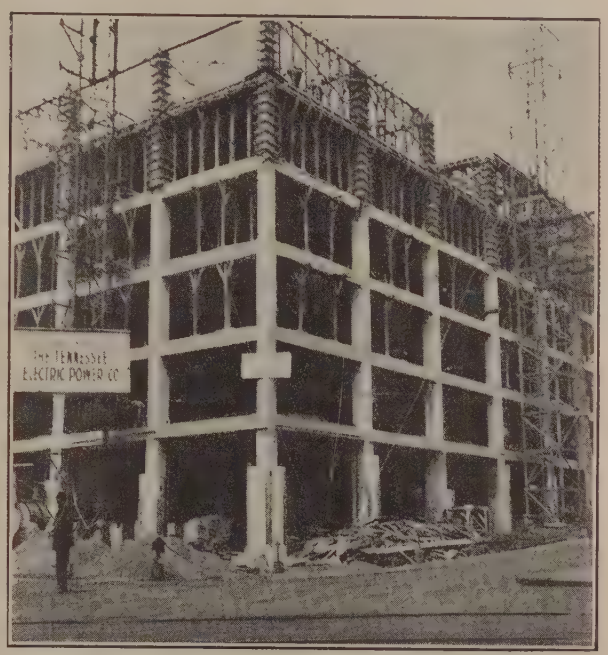
The insurance premium is relatively small as compared with other items making up the total operating expense of a public utility, and is not especially attractive to the operator who is looking for a place in which to make a showing by reduction in expenses. However, the actual saving in dollars output will often provide a handsome return for the time and effort given the subject. Attention to insurance matters, like safety-first work, should more than pay its way and show a net gain in employee morale, public opinion, etc., as well as render more remote the probability of a fire catastrophe.

How Premium Reductions Were Secured in Tennessee

Some features of our experience in Tennessee may be of interest to those who have never given personal attention to insurance matters. This company has four hydro-electric plants which are now covered with more than two and a quarter millions of insurance on the 80 per cent co-insurance basis. For a long time it was felt that the risk of fire at these plants was so slight that no insurance was necessary. However, in 1920 we called for an inspection and rating with the result that we were quoted rates ranging from 71 cents per hundred to 19 cents on the buildings and 76 cents to 24 cents on the contents, the average being 36.1 cents per hundred, and the premium on a one-year-term basis $8,600.

Obviously either the insurance companies' basis of rating was at fault, or our estimate of the hazard was wrong. Probably both were out of line. However, we called for a reinspection and in January, 1921, were quoted rates on the buildings ranging from 48 cents to 16 cents and contents 54 cents to 21 cents, with an average rate of 33.9 cents, and a premium of $8,075. Effective May 1, 1922, we got the benefit of the work done by the National Electric Light Association insurance committee, when rates were named ranging on the buildings from 38 cents to 6.9 cents and on contents from 40.3 cents to 13 cents, the average rate being 22.7 cents and the premium $5,400, or a saving of 33 per cent over rates previously in effect.

We have recently gone over the property again with the result that we secured further reductions effective June 1, 1923, the rates on the buildings now ranging from 23.8 cents to 6.9 cents and contents from 24.4 cents to 11.8 cents, the average rate being 16.2 cents and the premium on a one-year-term basis $3,850. It will be noted that the saving over the period described



Construction Like That of This New Headquarters Building Will Bring Minimum Insurance Rate

on this part of our property alone was $4,750, while the average rate was reduced from 36.1 cents to 16.2 cents. Of this the N.E.L.A. committee should have credit for $2,675. No changes have been made in plant which would not have been authorized as a matter of good practice regardless of premium savings, and no expense has been involved other than the time required to give close attention to the details.

The Tennessee Electric Power Company was formed last year by the consolidation of the Tennessee Power Company, the Chattanooga & Tennessee River Power Company and the Chattanooga Railway & Light Company, the railway division of which was brought from under receivership at the same time. When all the fire insurance policies were gathered together it was found that there were a great many of them, that they were written for various periods and expired at all sorts of dates. The thing was unwieldy and the need was evident for a rearrangement along lines which would

make it easier to keep track of it. Our property comprises the four hydro-electric plants previously mentioned and two steam plants, with substations scattered over a wide area, the railway and light and power distribution systems in Chattanooga, offices, stores, distribution systems in smaller towns, employee camps at the power plants, and miscellaneous residences, etc., acquired in times past with power line rights-of-way.

A study was made of the whole situation, involving the rerating of a large number of buildings, and the whole business was thrown into a general form. All outstanding policies were canceled pro rata and the insurance was rewritten through local agents for a three-year term. Our present policy is to distribute

The Tennessee Electric Power Company

As used in this policy, it is understood and agreed that:

DIVISION A covers on buildings, their additions and extensions, sheds and fences, and including all permanent fixtures not otherwise insured, plumbing, heating apparatus, awnings, attachments and appurtenances, and including with power houses small gate hoist buildings at top of dam, and trestles and tracks alongside and inclines adjoining power house, as described and covered in items below.

DIVISION B covers on all machinery, fixed and movable, including boilers and engines and attachments, shafting, belting, pulleys, hangers, and all electrical equipment (not otherwise insured), including dynamos, generators, boosters, switches, wiring, lamps, and the complete electrical equipment of and in buildings; and office, store, and dwelling furniture, fixtures and equipment and supplies, including maps and drawings, wagons, harness, horses and mules (no one animal to be valued at over $300.00), tools, dies, implements, models, patterns, their own or for which they may be legally liable, and employees' clothing, all while contained in buildings or adjacent thereto, as described and covered in items below.

Item No.	Occupancy	Location	Construction of Building	Division A	Division B
		ATHENS			
1	Storehouse	.....	.....	$75	.....
		CLEVELAND			
2	Machine shop	.....	Brick	4,500	$8,000
3	Storehouse	.....	Iron clad	1,500	.....
4	Substation	.....	.....	1,200	2,000
5	Switching station	.....	.....	3,000	2,500
6	Storeroom and office	No. Side Raht St.	Brick	2,500	1,500
7	Garage and storeroom	No. Side Raht St.	Brick	2,000	.....
8	Store and office	711 31st St.	Brick	.....	400
		CHATTANOOGA			
9	Car house	Third, Market and Broad Sts.	Concrete and brick	96,000	1,920
10	Repair shop	Third, Market and Broad Sts.	Concrete and brick	38,400	22,400

Head of a Sheet Covering All Property to Be Insured, Printed for Convenience in Negotiating Insurance. Complete Table Includes 114 Items

fire insurance business rather broadly among the local agents, who in turn place it with the companies they represent, and consequently we still have a considerable number of separate policies and all are involved in the settlement of even a small loss. To assist in handling all matters between agencies and insurance companies we have written our insurance through one agency acting as broker. The broker retains a portion of the regular commission as his compensation. The full premium is paid to the broker and losses are settled for by him, thus relieving us of a lot of detail which is better handled by those in the insurance business, while we retain direct control of all those matters of interest to us.

While it is rather general practice to cover properties of this kind by a general form both for ease in handling and for the purpose of offering the insurance companies a diversified risk, there are certain features in our form which may be of interest. We have approximately a half million dollars of outdoor substation equipment which takes a 7-cent rate, or if written for a three-year term, a rate of less than 6 cents per hundred. The likelihood of fire is not great, but we have considered it worth covering on these terms. Equipment of this type is subject to relocation from time to time and we have therefore blanketed the whole equipment in a lump sum so that any piece is covered while at any one of the locations specified in the policy. We have some $300,000 worth of supplies and spare parts distributed among a number of locations. The values at the various points constantly fluctuate, while the total remains reasonably constant. We have covered these supplies in a lump sum by a provision in the general form protecting us against loss so long as they are in or near any of the buildings owned by the company. This permits us to shift our supplies from point to point as occasion may demand. Supplies on the line wagons or on the job at a distance from our buildings or at a railway station, etc., are covered by a blanket provision protecting us against loss of any of our supplies to the extent of $1,000 while they are anywhere in the state of Tennessee.

In attacking the rate problem we have never been opposed by any insurance interest and have found the rating authorities more than willing to meet us half way whenever we have shown a serious interest. The inspection bureau is ready to furnish data showing just how any rate is arrived at, and it may readily be determined just what saving can be made by correcting the defects which they point out. Many needed improvements can be paid for by savings in the insurance premium.

Electric Locomotive for Interurban Freight Service

Field Control Motors with Forced Ventilation Give High Continuous Rating—Locomotive Will Haul 1,180 Tons on Level Tangent Truck

A LOCOMOTIVE designed for transporting short-haul freight has been built for the Interstate Public Service Company, Indianapolis, by the Westinghouse Electric & Manufacturing Company. The conditions existing on this electric line are similar to those to be found on many interurban lines and will show very well the necessity for a locomotive which is particularly adapted for interurban service. It is necessary for this railway to haul freight cars through the city streets at several points, and on account of this fact the width of the locomotive must be limited to 9 ft. Previous to this time, practically all of the locomotives built for use on interurban lines had a cab 10 ft. in width. This severely handicapped freight haulage through city streets.

The trucks are of the rigid bolster equalized type and built with rolled steel end and side frames, located outside of the wheels, which are 36-in. rolled steel.

The brake equipment consists of air and hand brakes operating on all wheels. The rigging is actuated through a radial type brake beam which permits effective braking on short curves. The equipment is an adaptation to electric locomotives of the standard steam locomotive air-brake equipment. It includes an independent straight air brake for handling the locomotive alone, together with a quick-action automatic brake for both locomotive and train. The length of the brake lever and diameter of brake cylinder mounted underneath the cab are proportioned to give a total shoe

pressure of 75 per cent of the weight of the locomotive with 50 lb. cylinder pressure.

The cab is substantially built. Two windows are provided on each side, with a door and two stationary windows at each end. On the rolled-steel checker-plate platform at one end of the cab is mounted a sand box, an air reservoir and a blower housing. On a similar platform at the other end are a sand box, an air reservoir and a locomotive bell. The underframing is built up of rolled steel channel side and center sills with cast-iron bumpers.

ELECTRICAL EQUIPMENT

The locomotive is equipped with four 100-hp. 600-volt field control motors arranged for forced ventilation and using a gear ratio of 17:60. The low-speed type of motor used is very well adapted to freight haulage in that it is able to develop large tractive efforts and drawbar pull without drawing excessive current. Forced ventilation is provided by the use of a blower runner mounted directly on the shaft of a 600-volt blower motor. The blower motor is mounted just inside of the cab at the No. 2 end, so that the shaft extends through the cab sheeting for the fan mounting just outside. The fan is inclosed by a housing which is provided with louvers, assuring a supply of dry air for the motors. The space between two of the center sills is closed with a sheet-iron plate, thus forming a duct for carrying the air from the blower to openings adjacent to each motor, from where flexible canvas connections conduct the ventilating air to the motors.

LOCOMOTIVE RATINGS

	Tractive Effort Lb.	Volts	Speed M.P.H.	Ventilation
For one hour with motors on short field.....	13,880	600	11.3	Forced
	13,000	600	11.5	Natural
Continuous with motor on short field.....	9,000	600	13	Forced
	5,900	600	15.3	Natural
Maximum capacity.....	25,000			
Normal adhesion for starting duty only...	25 per cent of locomotive weight			
Maximum safe speed.....	35 miles per hour			

The standard Westinghouse electro-pneumatic control is used. Sixteen type UP unit switches are mounted between angle steel equipment supports located inside of the No. 1 end of the cab. The main controller and the reverser are provided with interlocks so that the switches cannot be closed unless the reverser is either in the forward or reverse operating position.

All of the electrical apparatus is mounted in a compartment approximately 4 ft. long and 6 ft. wide, extending from the floor to the roof of the cab. The accelerating resistors are mounted near the top of this compartment.

Ventilation is obtained through the roof by means of two ventilators. The unit switches are mounted directly beneath the grid resistors, while the reverser, overload relay, motor cutout switch and other apparatus are mounted so as to be accessible from both the front and rear compartments, which simplifies the maintenance and inspection. The equipment compartment is inclosed by removable doors or covers to prevent accidental contact of the operator with any of the electrical apparatus. A sixteen-notch master controller gives a large number of accelerating steps, so that a very heavy trailing load may be started without abuse to the equipment and with a minimum of wheel slippage.

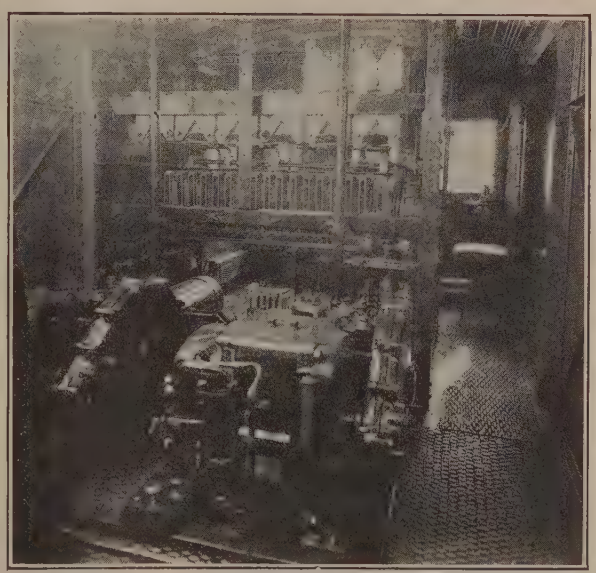
The air compressors are mounted in the space adjacent to the equipment compartment and the installation or removal is facilitated by a removable section of each side of the cab. They supply air at 85 to 100 lb. pressure to the reservoirs mounted on the platforms at each end of the cab. Cooling pipes are inserted between each compressor and the air reservoir and also between the two reservoirs. A reducing valve provides 70 lb. pressure for the control reservoir for supplying air for the control apparatus, sanders, whistles and bell.

Locomotive for Interurban Freight Service on the Interstate Public Service Company's Lines

The locomotive for the Interstate Public Service Company is arranged for double-end operation and has two air compressors and a blower equipment. The accompanying table gives the ratings of the locomotive.

At the continuous rating, with motors operating on short field and with forced ventilation, this locomotive is capable of hauling a trailing load of approximately 1,180 tons on level tangent track.

The general design of this locomotive is standard, so that similar machines may be built for single- or double-end operation, and may have one 50-ft. compressor or two 35-ft. compressors, with or without forced ventilation and may be provided with or without multiple-unit control.



The Air Compressors Occupy the Foreground with Unit Switches and Grid Resistors in the Rear. Directly Behind the Compressor on the Left Is the Reverser

Akron People Respond to Appeal for Higher Fare

Railway Advertises that "The Actual Cost of Your Car Ride Is 5.7 Cents; Please Help Meet It by Dropping 6 Cents in Fare Box"—Twenty per Cent of the Riders Pay the Extra Cent Voluntarily

By E. B. Atchley
Northern Ohio Traction & Light Company, Akron, Ohio

FOR three weeks this appeal has been made to the car riders of Akron by the Northern Ohio Traction & Light Company, and is still being made through newspapers, car cards and in the company's publication—the *N. O. T. & L. News*. For two weeks prior to the date fixed for the payment of the "Voluntary 6-cent fare" advertising explaining the cost of the ride was presented the public.

The result has exceeded the expectations of the company, an average in excess of $200 daily coming in at this time in pennies from approximately 100,000 passengers carried.

Day by day the number of pennies that fall into the fare box is increasing. It is almost impossible to make an accurate check for the reason that the Cleveland fare box is used and there is no registration.

On Sept. 1, however, the company placed "voluntary 6-cent tickets" on sale. Many business firms bought tickets, sending in their checks, and nearly 1,000 car riders bought strips the first day. The tickets were put in strips of 5 and sold for 30 cents a strip. Since the first day there have been additional purchases.

The action of the company in appealing to the people of Akron for relief follows negotiations for a new franchise which have been in progress for years without results. Time after time the company has been on the point of getting a new franchise-contract through the Council for submission to the people, the city charter requiring submission, but at the last moment something has arisen to block progress.

The last proposal of the company was for a 6-cent cash fare, nine tickets for 50 cents with city control of service and a twenty-five-year agreement. This was finally rejected by the city and with it came the demand for a short-term franchise and a straight 5-cent fare with free universal transfers. The company could not accept this.

Figures were submitted by the company showing that the total cost of carrying passengers in the city, including a fair return on the investment, and allowing for depreciation, was 7.2 cents. Figures were also submitted to the public utilities committee of the City Council showing that the *actual cost* of the ride, excluding depreciation charges and interest on the investment, was 5.7 cents, divided as follows:

	Cost per Passenger, Cents
Wages	2.3384
Equipment	.8835
Power	.7818
Track	.7299
General and miscellaneous	.7073
Taxes	.2558
Traffic	.0113
Total	5.7080

At that time many persons said that the company was entitled to its demand of 6 cents cash, or nine tickets for 50 cents. Others believed there should be a transfer charge.

In the recent municipal primary campaign, one of the candidates stood boldly for a flat 5-cent fare and a short-time contract. This candidate was defeated. Another candidate, who has always opposed the company although he said nothing in the campaign, was defeated for nomination.

The company made it plain, however, when it began advertising, that the 6 cents was necessary to continue the *present service* and the action had no political significance. It pointed out that the present service far exceeds the service provided for under the terms of the old franchise, which expires on Feb. 1, 1924.

The action of the company in putting tickets on sale caused an uproar among the politicians and some city officials, including the Mayor. The Mayor sought to invoke the aid of the city's law department to prevent the sale of five tickets for 30 cents, and one or two councilmen asked the same department if something couldn't be done to stop the advertising.

"The city is getting a black eye in this advertising," declared Councilman Rose. "We are being made the laughing stock of visitors. Something must be done."

The legal department is reported to have expressed an opinion that gave little satisfaction to the protestors. "There's no law against honest advertising, and the people can pay what they want to pay in excess of the franchise fare," is the substance of what the law director said to the Mayor.

And that settled that!

Now it is said a committee of citizens has again taken up the question of a new franchise in the hope of ending the controversy. What has been done along this line, if anything, no one seems to know.

The advertising used has been carried in the company's magazine, the *N. O. T. & L. News;* in sectional strips on the upper ends of the cars, posters inside the cars, in newspapers and local magazines.

The figures which were submitted included nothing for depreciation and no interest on the investment. These facts were clearly pointed out in all advertising.

The company also showed the old franchise service provisions in comparison with the service now being supplied. It pointed out that 120 new city cars and twenty-four buses had been placed in service in the last few years; that lines had been extended, rebuilt and double tracked; that a new line had been constructed across the $2,000,000 viaduct which bridges the Cuyahoga Valley, and in many other ways the

system had been improved to enable the company to provide a betterment of service. At the same time the company declared:

"We have lost money on the Akron City system for years. Steadily adding to the investment may have seemed to some not good business, but—

"We have never lost faith in the people of Akron. We firmly believe the people of this city do not want this company, or any other company, to operate for less than cost."

Before the appeal was made to car riders to voluntarily pay the additional penny, talks were made to the company's trainmen. They were urged to express the thanks of the company to patrons paying 6 cents. This co-operation has undoubtedly been beneficial.

When Detroit went to a 6-cent cash fare and the Cleveland ticket fare was abolished the company took the opportunity to point out rising labor, material and fuel costs.

Here is additional evidence of how no opportunity was overlooked. A newspaper man called the advertising department of the company and said: "You certainly have more confidence in the public than I have. I don't think it will respond to your appeal. You might as well save your money."

The next day the following advertisement appeared in all the papers:

One of Our Friends Said to Us Yesterday:

"You certainly have more confidence in the people than I have."

Confidence in the people—in the people who ride our cars!

Certainly we have confidence in them, and why not?

We have found the men and women who ride our cars disposed to give us a square deal. They are the *kind of people who believe in dealing fairly by everybody.*

They do not want something for nothing!

Faith in them? Every day in the week we will pin our faith to them.

Believe they will answer our appeal and in fairness drop 6 cents into the fare box?

Certainly we believe they will!

We have confidence in the car riders—and we firmly believe the car riders are going to assist us in maintaining the service we are supplying—a service far in excess of the old franchise requirements.

Thank you!

Still another piece of effective advertising was the following placard used in the cars:

Do You Know?

154 cities have a 10-cent fare;
4 cities have a 9-cent fare;
109 cities have an 8-cent fare;
186 cities have a 7-cent fare;
99 cities have a 6-cent fare;

In only *two* cities have fares been increased by court order.

Car riders of Akron are *voluntarily paying 6 cents.*

The *actual cost* of the car ride is 5.7 cents!

In the advertising there has been no let-up in the campaign from the day it was inaugurated and there will not be. As stated, the old franchise expires on Feb. 1, 1924, and the company believes that by that time the people will have become so thoroughly conversant with the situation that there will be no objection from those who ride the cars to paying the cost of their ride.

Is the campaign proving a success? Here is the answer:

Sunday, Aug. 19, the first day, nearly 10,000 pennies fell into the fare box. On Monday, the next day, the number increased to 19,000. It fell to 17,000 on Tuesday; went to 22,000 on Wednesday; decreased Thursday and Friday, and exceeded the 22,000 mark on Saturday.

Since the first week between 19,000 and 20,000 pennies—the number increasing somewhat day by day—have been placed in the fare box daily.

The average number of passengers carried slightly exceeds 100,000 in the city, so that nearly 20 per cent of the riders appear to be paying the 6-cent fare.

Now that the tickets have been placed on sale there is reason to believe that the percentage of those paying the 6-cent fare will be still further increased.

Observations in Three Tennessee Cities

Accident Prevention, Systematizing of Insurance Policies, Pull-In Records and the Railroad and Public Utilities Commission Were of Special Interest

BY "SPECTATOR"

CHATTANOOGA, Nashville and Knoxville, Tenn., are cities in which railway conditions are similar in many ways. The railways in these cities, as well as the other industries, are supplied with power by the Tennessee Electric Power Company, a virile, composite organization, made up of several railway and power companies now thoroughly merged. The railways in these three cities are fortunate in being affiliated with the prosperous power business.

One element of uncertainty which I found among the railways in Tennessee is the future status of the Public Utilities Commission, which is under vigorous political fire. The commission is elective and hence is necessarily "in politics." As far as can be learned, it is endeavoring to give the utilities a square deal, but it occupies a difficult position. The Governor appears to favor a commission of a different character, with commissioners appointed, but with provision for changing only a portion of the commission in any one year. It appears to me that the principle of regulation by commission is on trial in Tennessee and the outcome of the present agitation will be of general interest throughout the country.

In Chattanooga the intimate relation of the railway and power departments of the company is illustrated by the large use made of display spaces on the cars for the advertising of power service. Legends for this purpose are mounted in the car windows, so that from the street side they read continuously from end to end of the car. On its inside space each card bears a separate legend.

The shops at Chattanooga are particularly commendable, being roomy and cheerful and bountifully supplied

with labor-saving devices. Traveling air hoists are particularly in evidence.

Since the formation of the Tennessee Electric Power Company was brought about the company has been making a comprehensive study of fire insurance, which is now on a systematic basis, one blanket policy participated in by several insurance companies covering the whole property. This is the subject of a special article on another page of this issue.

Signal Mountain and Its Railway

In Chattanooga there is an interesting mountain railway serving a thriving group of industries centering in Signal Mountain, namely, the Chattanooga Traction Company. Just ten years ago two land companies were formed to develop the territory adjacent to the city below and on Signal Mountain, 12,000 acres in all. Coal mines were opened up, an attractive hotel and cottages were built on the mountain, 1,500 ft. above the city, and manufacturing industries were encouraged to locate on the tract. The railway, of course, formed an essential feature of this development, as it was to supply all the local transportation. The railway was built according to the best practice, and its construction involved unusual difficult operating conditions of grade and curvature. A maximum grade of 5⅜ per cent was encountered, and the curvature in places seems almost too great for operation. These curves are, however, "negotiated" safely and without excessive wear on the equipment. There are three "horseshoe curves" on the mountain side. Of course it takes power to operate this line, each 26-ton car being equipped with four 70-hp. motors, geared to 33-in. wheels with a ratio of 20:66. The power comes from the Tennessee Electric Power Company, with which it has no financial connection, but whose tracks are also used for entrance to the city.

The passenger cars on Signal Mountain seat sixty-two passengers and the combination cars fifty, there being a roomy baggage compartment in each of the latter. Hourly service is given, and the fare for the 12 miles up the mountain is 25 cents. To Red Bank, 8 miles, the fare is only 10 cents, and that to Glendale, in the first zone, is but 5 cents for 6 miles. For the service given these fares are very low, but the company does a large freight business, which is much more profitable. In this service two electric locomotives are employed, and more than 500 carloads per month are handled. When enormous cement works now under construction are completed the freight business will be greatly increased.

Safety Campaign Active in Nashville

The Nashville Railway & Light Company, also a subsidiary of the Tennessee Electric Power Company, has been under fire, to show why the local carfare should not be reduced from 7 cents. Considerable stress was laid by the complainant on the fact that the company pays to one of the nationally known management and engineering companies certain fees for advice and engineering design and supervision. The company clearly brought out by expert opinion that it obtains full value for these fees and that a 7-cent fare is no bonanza in Nashville.

The Nashville Railway & Light Company is taking a leading part in the campaign recently organized to bring about accident reduction. J. P. W. Brown, general superintendent of the company, heads a newly formed local Safety Council. Headquarters of the council have been established in the Chamber of Commerce Building, with a former employee of the company in charge. Data which the council has promised for early publication in this paper will show remarkable results from these efforts.

There is a fine spirit on this property in the welfare work for employees and their families. The quarters of the Employees' Mutual Benefit Association and its program are like those of an enterprising club. The vocational educational plans of the company are also well advanced. As was illustrated in a recent article in this paper, the reclamation work going on in the shops is highly profitable. This work is supplemented by care in the purchase of supplies, as is illustrated in the case of lumber, of which a large quantity is kept in storage. Lumber is purchased in lots at advantageous times and stored under cover. The lumber storage contains a wealth of valuable wood, some specimens of which have been seasoning under natural conditions for several years.

Fine Pull-In Record at Knoxville

In Knoxville I found the railway officials highly gratified with their pull-in record for the preceding month (May), which was 17,963 miles per pull-in. This record can be understood in view of the company's excellent shop facilities. The machine shop, in particular, is one of the best that I have seen recently. The mechanical department has adopted a motto: "Careful fitting is the secret of success." It seems to work out well here with regard to maintenance.

Knoxville is the center of vigorous bus activity. Thirty-seven bus lines terminate in the city, at several centers. An association of bus owners has been formed, and there is talk of a union bus terminal. This traffic appears to be largely of non-competitive character with the railway.

The Knoxville company is increasing its demand upon the power company and is installing 10,000 kva. in transformers to supply additional power which is to be purchased. The transformers will step the voltage down from 120,000 to 2,300 for the railway and to 13,200 for large power customers. The power company is putting in a duplicate transmission line to care for this rapidly increasing business.

Knoxville is one of the cities which has found ballasted track construction to be the most permanent for the local conditions. This permanence is only secured, however, by careful tamping and draining. The ballast is compacted by as many as four tampings under traffic. The railway is co-operating with the city in regard to paving, so as to prevent breakage where the municipal and utility pavings join.

Municipal Operation of Tramways Predominates in Great Britain

INTERESTING statistics of British tramways have been issued by the Ministry of Transport. The data, which cover both tramways and light railways on public roads, show the following for the fiscal year ended Dec. 31, 1921, for companies and March 31, 1922, for local authorities. Total route-mileage in operation 2,579 (4,275 track-miles), of which 1,756 miles was operated by local authorities and 823 miles by companies. The total gross receipts for 1921-22 were £32,523,339 and the total operating expenses were £26,835,292, leaving

net receipts of £5,688,047, roughly an improvement of 30 per cent over the preceding year.

Passengers carried numbered slightly over four and a quarter billions, a decrease of nearly 9 per cent from the preceding year, while the car-mileage decreased slightly under 4 per cent. The operating ratio fell to 82½ per cent from 86.44 per cent, as it was during the preceding year, as compared with 64½ per cent in 1913 and 1914.

Of the 250 tramways in Great Britain 170 are owned by local authorities and eighty by companies. Of five track gages in use, ranging from 3 ft. 6 in. to 4 ft. 8½ in., 60 per cent of the track is of the last-named gage. More than 23 per cent is of the 3-ft. 6-in. gage. The average energy consumption during the year was 1.82 kw.-hr. per car-mile.

Combination Road and Drainage Ditch Crossing

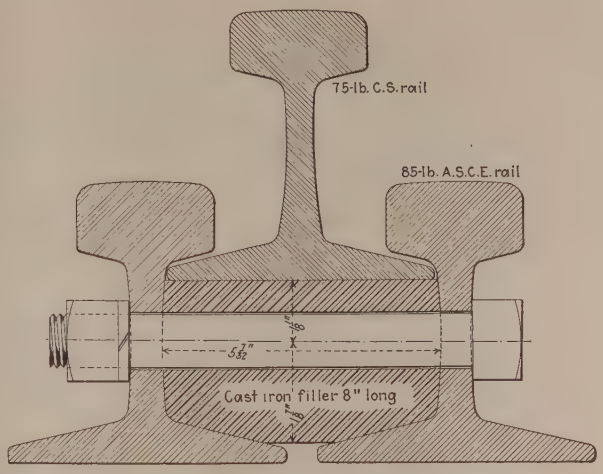
Unique Construction on Interurban Line of Pacific Electric Railway Made Necessary by Locating of Drainage Ditch Across Right-of-Way

BY CLIFFORD A. ELLIOTT
Cost Engineer, Engineering Department, Pacific Electric Railway, Los Angeles, Cal.

THE Los Angeles County Flood Control District is carrying out plans for handling the large volume of storm waters that collect each rainy season in southern California in a locality north of the Pacific Electric Railway's Del Rey-Redondo Beach interurban line near Rentchler station. In order adequately to drain this particular district, the county has constructed a concrete drainage ditch 40 ft. wide. The height of the retaining walls is 4 ft. from the base of the ditch to the top of the wall, which is 6 in. thick.

The drainage ditch follows the route of a highway and it was, therefore, constructed so that the floor of the ditch, which is suitably crowned, could also serve as a roadway, being built of concrete similar to a highway.

At the point of intersection with the interurban railway's tracks the ditch was spread to a width of 60 ft., running back 150 ft. at this width in each direction from the center line of the railway tracks. The highway was raised to the track level with a runoff of 250 ft. on one side and 350 ft. on the other. Wooden post barriers were placed along each side of the 20-ft. roadway on the raised section, and valley gutters, 4 ft. wide from the toe of the crowned highway to the face of the retaining wall, were provided. For the passage of the flood waters the railway installed under its double-track line two reinforced-concrete culverts which act as a water course for a section of the drainage ditch. One is located on each side of the 20-ft. concrete elevated highway.



Details of Method of Supporting Rail Over Culverts

These culverts are of the compartment type. The width of the opening in each is 6 ft. and its height is 3 ft. 3 in. The section of the railway right-of-way occupied by the culverts and not paved in was planked over, but where the 20-ft. highway crosses the railway tracks 6-in. concrete pavement was laid.

The tracks over the concrete culverts are of T-rail girder construction, two 85-lb. rails set longitudinally, forming with the rail a girder support for each rail of the tracks. This rests on inverted pieces of T-rail set in the concrete. Details of this plan for supporting the track rail over the 6-ft. opening are shown in one of the accompanying illustrations.

Where the concrete paving crosses the tracks, a 20-ft. length of 75-lb. C. S. revised section guard rail was mounted inside of each track rail, providing a flangeway in which the car wheel flanges can run without damage to the roadway.

At Top, Crossing of Pacific Electric Tracks with Combined Drainage Ditch and Highway Furnishes Interesting Construction Problem. At Left, Crossing of Tracks and Highway at Grade. At Right, Guard Rail Edges Concrete Paving and Provides Flangeway at Crossing.

The Readers' Forum

Factors in Rail Head Wear

THIRD AVENUE RAILWAY

NEW YORK, N. Y., Sept. 4, 1923.

To the Editors:

The article by Charles H. Clark in your issue of July 14, entitled, "Wear on Rail Head May Determine Life of Track," includes an interesting tabulation showing rail wear and corresponding car traffic at various locations in Cleveland. Mr. Clark's article gives the impression that in Cleveland, owing to the use of the "best modern construction," "the life of the track is practically the life of the head of the rail and the construction combined" instead of being controlled by "the life of the joints," which has been pretty generally the experience in other cities. Elsewhere in the article, the best modern construction is indicated to be, at the present time, "the solid concrete steel tie construction."

A summary of the tabulation given, obtained by adding up the items for the two classes of construction shown, is as follows:

Years in Service	Number Cars in Millions	Type of Ballast	Vertical Rail Wear in Inches per Million Cars Between At Stop	Stops	Average	Wear per Year
209	67.2	Crushed stone	0.088	0.066	0.077	0.025
466	156.3	Concrete	0.099	0.059	0.079	0.026
675	223.5	Total	0.095	0.061	0.078	0.026

The rail wear as shown by this summary is substantially the same with concrete and with crushed stone construction. With the exception of the first item, which is track that has been in service eighteen years, none of the rail given in the tabulation has worn more than ⅜ in. vertically. As this includes only part of the Cleveland tracks, it is impossible to tell from it what the average wear on Cleveland rail has been at the time of its renewal.

The sketch given on page 47 of worn rail section 95-400 indicates wear of about 13/32 in. if measured on the edge of the head next to the gage line fillet. In referring to it Mr. Clark comments that it was removed on account of cracking of the web below the head. He gives a movement of 21,000,000 wheels over this rail. Assuming these to be under double-truck cars similar to those at present in use in Cleveland would give a movement of 5,250,000 cars, which, at the average rate of wear in the table, would give a total vertical wear of 0.41, or 13/32 in., which is about half the amount of wear shown on the sketch. This figure of 13/32 in. also agrees fairly well with the figures given in the paragraph at the bottom of the first column on the first page of the article.

In actual practice rails are often removed for reasons not by any means controlled by the amount of wear on the rails. Pavement renewals and political considerations all tend to make the life of the rails much shorter than the maximum which could be obtained if the joints permitted the rail to be worn down to a minimum thickness between joints, and if nothing else interfered arbitrarily to shorten the life of the track.

The article contains a diagram showing the average cars per mile per year. The variations above and below the mean since 1914 are practically equal in amount, averaging 126,000 cars per mile per year. A second diagram shows the average age of track removed each year. In 1916 this was only about 11¾ years, which was extraordinarily low for an average figure, and probably much below the average of the country generally, showing that track renewals in Cleveland had been made on an exceedingly liberal basis. This seems readily to account for the increased average life of track removed since that date, the present average of about 17¼ years being considerably nearer the normal of other companies. It is also to be noted that this increase in age coincides with the war period from 1916 to 1919.

In the last paragraph of Mr. Clark's article he refers to tilting the rails at an angle of 1:25, which, he concludes, "means at least 15 per cent more life." It should be noted that the redesigned Cleveland rail referred to in the next sentence is not intended to be used tilted, and the additional life which may be expected of it is due to the fact that the head of the rail is a quarter of an inch thicker than in the old section, making the total height of the rail 7¼ in.

The main conclusions the writer wishes to draw are, first, that there is nothing in the figures given to show any superiority of solid concrete construction over construction using crushed stone ballast; and second, that the increased average life of track removed dating from the beginning of war-time conditions in 1916 seems to be due to other causes than the rate of rail wear.

E. M. T. RYDER, Way Engineer.

Reproduction Method of Valuation More Convenient to Apply

NEW YORK, Aug. 28, 1923.

To the Editors:

I was much interested in your comment last week on the reproduction and investment methods of valuation from the standpoints of public relations and the reward of good judgment. Fortunately, it is not necessary longer to discuss which method is the more just to utility and public. That is up to the courts and commissions, and they are settling it rapidly.

There is a phase of the subject, however, to which attention might also well be directed, and that is the relative convenience in application of the two methods. In this, the reproduction method is far superior to the investment method for any properties except the very modern ones. With cost of reproduction as a basis, the facts are always available if one seeks them, but the investment method means dependence on historical records, which, if they exist at all, are nearly always apt to be incomplete. And incompleteness in this case practically means that many important items of expense must be omitted because they are unknown or cannot be proved. Some knowledge of the historical conditions surrounding the installation must be available, even with the reproduction method, but nowhere nearly as much as with the investment method. In consequence, reproduction valuations of several properties recently show practically no difference in the inventories, as determined by the engineers of the opposing sides. Such is more apt to be the case, of course, when the inventories are made at the same time and the engineers can compare notes. The differences that exist in the valuations usually occur in the intangible items to be included and the price data.

ENGINEER.

Association News & Discussions

Pacific Claim Agents Hold Successful Meeting

THE most successful convention ever held, was the general verdict after the meeting of the Pacific Claim Agents' Association at Portland, Aug. 22 to 24. The good results obtained in that city along safety education and accident prevention lines were of particular interest to the claim agents. It was the opinion that this had been brought about principally through the hearty co-operation between municipal officials and the railway.

Safety and Its Relation to the Public

In a paper read by B. F. Boynton, Portland Railway Light & Power Company, the problem of interesting the public along safety lines was discussed. "You must first thoroughly demonstrate that you are sincere," said Mr. Boynton, "that you understand what you are doing, and that you are perfectly willing to work hard, not for private gain, but for the general welfare. Beneficial results can be obtained by talking to school children about accident prevention. The organization of safety officers at each school, who report to their principals any infraction of traffic regulations, has been found a helpful scheme. Whenever an accident occurs, and one of these safety officers is near, he immediately gets all the data possible and turns them over to the chief of safety officers.

"One of the best ways to get the confidence of the people is for the claim agent who is a good mixer to affiliate with all the different civic bodies in the city, attend the meetings regularly, be willing to work hard along any helpful lines of civic work, to show himself willing at all times to help the other fellow when he needs assistance. The latter will then be more ready to come to your aid when you need him."

Discouraging Litigation in Damage Claims

J. H. Handlon, Market Street Railway, San Francisco, spoke on methods by which litigation can be discouraged. "What can we do toward prevailing upon claimants to abandon all thoughts of litigation?" said Mr. Handlon. "We must by our conduct, by our own behavior, instill confidence so that the 'other fellow' has faith in us. We must establish, if possible, in the minds of claimants, the thought that we are striving to deal justly by them. Let us endeavor to convince them that we are trying to obtain a proper perspective of the merits of their claims. We must try to eradicate any impression which they may have that we are advocates paid solely to champion the interests of the company.

"We must give claimants to understand that the lawyer representing the company is hired to plead, support, vindicate and defend the company, therefore the lawyer is right in assuming a fighting attitude when combating litigation; but as claim agents we aim to be just as impartial as a judge or jury weighing the merits of the case.

"The publicity given to the methods employed by the company in striving to prevent accidents is a factor establishing a friendly feeling toward the company. Claimants then are more disposed to look kindly upon offers of settlement, for they are not so vindictive and not so likely to ask punitive damages.

"The good will of lawyers and doctors should be cultivated. Lawyers are encouraged to deal directly with the claim agent. A lawyer ordinarily wants to facilitate the handling of the claim without burdening himself with too much effort. We should pave the way to a final disposition of the claim by putting him to as little inconvenience as possible. We are always trying to develop the good will of physicians in numerous ways, particularly by making an effort to protect their bills and by allowing them liberal fees.

"The general public's letters are acknowledged in prompt, respectful and business-like fashion. Persons are treated courteously on their arrival at the office. Our reception room is supplied with newspapers and magazines for their convenience. Our walls are covered with accident prevention placards and similar exhibits, planned to interest them if they are compelled to wait before being interviewed. Telephones and drinking water are at their service. They are not only pleasantly greeted but given to understand that we do not look upon them with suspicion; that it is our wish to pay what we owe and we do not have any intention of evading our just obligations; that we merely ask their co-operation in gathering the facts; that everybody, whether rich or poor, influential or forsaken, is treated alike."

Liability of the Auto Driver to His Guests

In a paper A. L. Levinsky, Stockton Electric Railway, said that at the San Diego convention, after a discussion upon this subject, it was suggested that action should be taken at the next session of the Legislature to have the statutes upon negligence amended so that railways might escape the burden cast upon them by the decisions on the liability of the automobile driver to his guests. He therefore wrote to the law departments of various transportation companies, and two bills were finally agreed upon, which were presented to the Legislature, but unfortunately did not obtain favorable action. After giving the proposed amendment very careful consideration, it was felt that it was an intricate matter to prepare an amendment which would be constitutional.

Mr. Levinsky stated that in line with recent decisions, it has been held that if the driver and guest were engaged in a joint enterprise, then the negligence of the driver could be imputed to the guest.

But in order that there be such a joint undertaking it is not sufficient, according to court decisions, that the passenger or occupant of the machine indicate to the driver or chauffeur the route he may wish to travel, or the places to which he wishes to go, even though in this respect there exists between them a common enterprise of riding together. The circumstances must be such as show that the occupant and the driver together had such control and direction over the automobile as to be practically in the joint or common possession of it.

Education of Employees

H. G. Winsor, Tacoma Railway & Power Company, in a paper on education of employees, said that some companies have attempted education in various ways, but the results have been in most cases unsatisfactory, principally because the objective has been clouded, or the means of accomplishment lacking. "As claims men," continued Mr. Winsor, "we have for a number of years persistently followed a plan to educate our employees in accident prevention. The results have been beneficial from the humanitarian and financial view points.

"I have been very much interested in a report by Mr. Handlon which contains the record of proceedings of a research committee appointed in November, 1920, by President Von Phul of the Market Street Railway and working in co-operation with the Pacific Coast Bureau of Employment Research. The principal application to education of the work reported by this committee is found in the mental tests in which employees, principally motormen, were examined in various ways to determine their mental ability

properly to perform their duties. The results agreed with those secured in other industries and in the United States Army. Many men were found to have the mentality of a person ten to fifteen years of age. This condition, which is reported to exist in all industrial groups, emphasizes the need of education.

"As claims men we have only a limited opportunity in the education of employees. Such work of this nature as we have undertaken in the past has, we believe, proved successful. Our experience must, therefore, be of some value in any development which our employees may undertake."

OFFICERS ELECTED

The officers elected for the following year are: President, P. O. Solon, San Francisco-Oakland Terminal Railway; first vice-president, S. A. Bishop, Pacific Electric Railway; second vice-president, V. F. Bennett, San Diego Electric Railway; third vice-president, C. R. Peck, Portland Railway, Light & Power Company, and secretary-treasurer, B. F. Boynton, Portland Railway, Light & Power Company. The new executive committee will consist of J. H. Handlon, chairman; T. G. Aston, H. G. Winsor, W. H. Moore, C. A. Blackburn, F. E. Oakley, H. K. Relf, A. M. Lee, A. L. Levinsky, and C. N. McRoberts.

Track Building with Steel Ties*

BY CLYDE L. HEDGES
Wisconsin Railway, Light & Power Company, La Crosse, Wis.

OUR track program this year for city track construction in La Crosse calls for the relaying of 2.7 miles of track, all in paving. Of this track 1.2 miles is in bituminous concrete paving, and the balance in brick. All was laid with 6-in. 72-lb. T-rail except 0.1 mile, which we laid with 70-lb A.S.C.E. section, in bituminous concrete paving.

For foundation to be placed under wood tie construction 5 in. of No. 1 and No. 2 limestone is used. It is rolled with a 10-ton roller, sufficient No. 3 crushed limestone being used for tamping before rolling, thus making a total of 6 in. of rock under the ties. Dayton mechanical ties will be used for 0.8 mile and on the balance 7-ft. cedar ties. Concrete to the depth of 5 in. is placed between the ties and under the rail in wood tie construction, for support of paving. Standard spikes 5½ in. x ⅝ in. are used. Experience has shown tie rods are not necessary.

For joint welding we use an Indianapolis welder. All of our track this year will be welded with Apex joints, which are preferred to the Simplex joint on account of the better head support. Four pounds of Grade "B" and 1 lb. of Grade "C" welding material are used on each joint. Our joints cost about $6.55 each, divided as follows:

Labor	$0.75
Current	.60
Welding material	.50
Welding plates	4.70
Total	$6.55

Under the ball of the rail and adjoining the web, cement mortar is placed, against which the outer paving block is laid. Along the gage side of the rail a special mold block of Nelsonville pattern is placed of size to fit the rail. A special Nelsonville stretcher brick is laid inside of the rail. Three rows of regular paving block are placed lengthwise adjoining the outside of the rail.

We have purchased new double curves wherever necessary, arranged for car clearance. Wherever we have replaced any switches, iron-bound manganese hard center construction is used. All our switch points are arranged with reversible automatic spring switch boxes.

Our plan for the installation of the Dayton resilient tie is as follows: We establish a grade for street paving, and roll with a 10-ton roller. Then the track is located and under each rail a trench is excavated 15 in. wide and of sufficient depth to allow 6 in. of concrete between the bottom of trench and bottom of ties after the rail has been brought to grade. We then place wood ties across the trench about every 20 or 30 ft., the distance being governed by the weight and flexibility of the rail installed. The rails are set in position on the ties above the trench grade. We then hang the ties to the rail by means of the fasteners which are provided with them. At first only every fourth or fifth tie is hung in order that the track gage may be verified at points where these ties are installed. The intermediate ties may then be hung and fastened permanently. In spacing the ties 3-ft. centers are allowed, and the space is closed to 2-ft. centers next to the joint tie. After all ties are properly spaced and fastened, track is lowered on 12-in. blocks spaced every 20 ft. in the trench. Old ties may be used for blocks. The track is ready for final line and grade after it is lowered on the blocks. Wood shims are used between wood blocks and rail wherever necessary. In tightening the tie fasteners, a short wrench not more than 10 or 12 in. long should be used, and care should be taken not to screw the nut tighter than is necessary to seat the rail firmly upon the tie block. The Dayton tie has a cushion of asphalt ½ in. thick under each of the wood blocks, and if the nuts are run down too far the asphalt will squeeze out between the two blocks.

The following concrete mix is used: One part portland cement, three parts sand, six parts coarse aggregate. If pit run gravel is used it should be free from soil, and the mix used is one part cement to six parts gravel. In pouring the concrete a man should be present constantly with tamping bat to see that no voids are left under or about the tie blocks.

In welding the joints it is good practice to weld the base of the rail to the top plate of the joint tie.

A rail grinder supplements the work of the track welder. With the welder and grinder we have been able to save a great deal of special trackwork such as frogs, switches, mates and crossings. The worn-out frog or switch is built up by depositing new metal, which is then ground down without disturbing paving or traffic. Cupped joints and deep depressions are filled in and then ground to the original surface.

It is our intention to go over all joints on our new work and grind off any slight high spots the rail may have, and we will then have a perfect joint. Our welder has been used to fill bolt-holes in car trucks which have become oblong through wear. These holes have been filled in solid with new metal and then rebored. This is much more satisfactory than the old method of plugging and redrilling. We have been able to weld many new ears on gear cases.

On one of our streets a number of years ago the operators of the property at that time installed 70-lb. A.S.C.E. rail in brick pavement. To bring the rail to proper height for 4-in. paving brick the 70-lb. rail was laid on wood shims on wood ties. The shims have since rotted out and the track has become depressed in the pavement. We have found it necessary to relay the 70-lb. rail with 72-lb. 6-in. T and repave between the rails. We have been able to save most of the brick for repaving by laying them with the worn side down and asphalting in. For the above reason we are laying all new track with 6-in. rail.

*Abstract of a paper presented before the Electric Railway Section of the Wisconsin Utilities Association, Oshkosh, Wis., Aug. 17, 1923.

International Conference on Standardization

A CONFERENCE of the secretaries of national industrial standardizing bodies was held in Zurich and Baden, Switzerland, July 3 to 7. Thirteen countries were represented, including all of the more important industrial nations of Europe and America. The United States was represented by P. G. Agnew of the American Engineering Standards Committee.

A leading topic discussed by the conference was the interchange of information between the various national bodies during the development of the work in the different countries. While it was not possible to overcome all the difficulties existing, substantial progress was made. It is believed that the steps taken will lead immediately to a substantially increased amount of interchange of information during the earlier stages of standardization work, and that the way has been paved for a much more extensive interchange in the future.

Provision was made for continuing the work of the conference on the many administrative problems of common interest, through a loosely-knit continuing organization. An example of such work

planned by the conference is the translation of technical terms of special importance or difficulty in standardization work. There will gradually be built up such a vocabulary of technical terms, mainly in English, French and German, but supplemented as far as may be feasible and necessary by the corresponding terms in other languages. Another example is the work undertaken by the conference on the classification and nomenclature of standards.

Birmingham's Experiment with Trackless Trolley*

AT THE annual conference of Municipal Tramway Association, Portsmouth, England, Aug. 22-24, Alfred Baker, general manager Birmingham Corporation Tramways, presented a paper giving an interesting account of the reasons why the City Council determined to try trackless trolley cars and of the satisfactory traffic and financial results so far obtained on a route which was formerly occupied by a tramway.

Mr. Baker, in opening, said that the opponents of tramways had been delighted when it was announced some time ago that Birmingham had decided to abandon one of its tramway routes and to substitute some other system of traction. But the fact was that there was no system of traction that could cope with rush-hour traffic with the same ease and facility as the tramway. Tramways were as alive today as they ever had been and would hold the field for many years in dealing with large volumes of traffic.

In 1921 Birmingham Corporation was faced with the reconstruction of a very large amount of permanent way, a matter at that time of grave concern owing to the high cost of wages and material. At prices then obtaining, it was only on routes of enormous traffic that reconstruction could be faced without anxiety. The corporation was then reconstructing certain heavy traffic routes.

On the other hand, he said, there were certain other routes requiring reconstruction where the traffic was comparatively light. The Nechells route was one of the latter. It was only single track and ran through narrow streets. The alternatives to reconstruction were the petrol omnibus and the trolley omnibus. The former the corporation knew all about, having a large fleet already in operation, so it directed its inquiries to the subject of the trackless car system. After exhaustive inquiries it was decided to adopt the trolley bus as being the most suitable for this route.

In considering relative merits, the question of carrying capacity was very important. The tramcars running over the route were double-deck top covered vehicles seating fifty-four passengers each. It seemed to the corporation that any new vehicle adopted must be able to seat passengers approximating in number those carried on the tramcar. This seemed to point to the double-deck petrol bus, as the majority of the trolley buses running in England were single-deck vehicles carrying only from twenty to thirty passengers. It was known, however, that R. H. Wilkinson of Bradford was experimenting with a double-deck trolley vehicle carrying about fifty passengers, and this was investigated.

Operating Costs

The most important question was that of operating costs. The cost of running double-deck trolley vehicles of large seating capacity was unknown, as no vehicles of this type were in regular service in other towns. Such knowledge as they did possess, however, led the tramways committee to believe that operating costs would be less than petrol bus costs and that the working expenses would be similar to those of tramway operation. In coming to the decision to adopt the trolley bus, estimates were put forward to the effect that to reconstruct the tramway route would cost £90,000, while to install trolley buses would cost only £36,000. The gross total for the trolley system was £54,000, but £18,000 was deducted as the value of twelve tramcars transferred to other routes. The items of the £54,000 were: Twelve trolley buses, £36,000; alteration to overhead lines, £3,000; taking up tramways and making good the street for ordinary traffic, £15,000.

In regard to receipts, those of the tramway, based on previous years, were £28,300, while the expenses were £22,640, giving a gross profit of £5,660. If the amount required for reconstruction was made the subject of a loan, the interest and sinking fund charges would amount to £9,000, thus bringing out an annual loss of £3,340. For the trolley buses the receipts and expenses were put at the same figure as for the tramway, less a saving of 1.25d. per car-mile on permanent way repairs (£1,562). There was thus a gross profit of £7,222, and as interest and sinking fund charges would be only £4,100, there was a net profit of £3,122.

The trolley buses which were ordered provided seating accommodation for fifty-one passengers each—twenty-six in the lower saloon and twenty-five on the upper deck. The weight was 7 tons 6 cwt. (16,352 lb.) empty. After the tramway was pulled up and the road surface restored, the trackless cars began running on Nov. 27, 1922.

Comfortable Riding

The new system immediately took with the public. The trolley bus gave the passengers a most comfortable ride with an entire absence of jerks. They ran with extreme smoothness and were practically noiseless. There was no vehicle in transport service that for ease and comfort could compare with a properly constructed trolley bus. The route, which it had been thought had reached the limit of its capacity, immediately began to improve its returns. The trolley buses attracted more passengers than had ever ridden on the tramcars. The mileage run had been increased without increasing the number of cars in service.

Tables submitted showed increases of passengers per week, compared with the tramcars, ranging up to about 50 per cent. Receipts were also up, but per car-mile they were down, owing to the increased mileage run. Accounts drawn up for the period from Nov. 27, 1922, to March 31, 1923, showed that the traffic receipts of the trolley buses were £8,812, or 19.234d. per mile run. The total working expenses (excluding income tax and capital charges) were £5,789, or 12.648d. per mile run. The costs per car-mile under the various main headings were: Power, 2.131d.; traffic, 6.843d.; general, 2.351d.; repairs and maintenance, 1.209d.; contributions for health insurance and national insurance, 0.114d.

The figure of 12.648d. per car-mile compared with 15.407d. for petrol buses and 14.824d. for tramcars in Birmingham. While it was true that the full burden of repairs for the trolley buses had not yet been reached, still figures confirmed the view that operating costs of trolley buses need not exceed the costs of tramcar operation.

Spheres for Trolley Bus and Petrol Bus

Each system had its own sphere of usefulness, but for large volumes of traffic tramways held the field. If he was asked as to how he would employ petrol buses and trolley buses in conjunction with tramways, he would be inclined to suggest—though in every case local conditions would have to be the deciding factors—as follows:

1. In anticipation of an extension of an existing tramway, where it was reasonably probable that tramways would be required at some future date, he would use the trolley bus.

2. He would use the trolley bus in substitution for a single line of tramway where the traffic was light, or where it was not possible to double the track.

3. On routes in suburban districts where some sort of transport was necessary and where there was no likelihood of tramways being required, he would certainly use the petrol bus.

4. He would use the petrol bus in running cross-country routes and in connecting up the outer termini of tramways. Petrol buses could be made to serve a most useful purpose in linking together the country ends of the tramways.

Wrought Iron Bars and Plates Standardized by A.E.S.C.

THE American Engineering Standards Committee has adopted as tentative American standards the specifications submitted by the American Society for Testing Materials, one covering staybolt iron, engine-bolt iron and extra-refined wrought-iron bars; second for refined wrought-iron bars,

and a third for wrought-iron plates. The special committee in charge of these specifications was headed by E. C. Peck, representing the American Society of Mechanical Engineers. The committee further recommended that the American Society for Testing Materials should be designated sponsor, under A.E.S.C. procedure, for the future development and revision of these specifications.

C.E.T.A. September Meeting Announced

THE next regular meeting of the Central Electric Traffic Association will be held at Yellow Banks Hotel, Webster Lake, Ind., on Friday and Saturday, Sept. 14 and 15.

The morning session of Friday will be called to order at 9 o'clock and will be in the nature of a round-table discussion. All matters of importance should be brought before the association at this time.

The afternoon session will be in charge of J. S. Bleecker, general manager Indiana, Columbus & Eastern Traction Company. Mr. Bleecker is chairman of the committee on publicity of the Central Electric Railway Association and is taking this opportunity of bringing before the traffic representatives the value of publicity on the part of electric railways. Mr. Bleecker has arranged to have present representatives of the various committees on public utility information in the association territory.

American Association News

Transportation Plans for the Atlantic City Convention

ALL of the trunk line passenger associations of the country have authorized the sale of round-trip tickets to the convention in Atlantic City at the rate of one and one-half the single way fare. This will be done on presentation of a special certificate on purchase of ticket at the local ticket office. Certificates are being mailed to members by Executive Secretary J. W. Welsh.

One certificate is good for any member of the association, including dependent members of his family. Tickets may be purchased for the going trip beginning Oct. 4 to 10 inclusive, and the return trip may be made leaving Atlantic City up to Oct. 18, but must be by the same route as the going trip. Tickets will be validated at Atlantic City, N. J., by agents at the regular ticket offices.

Detailed arrangements have been placed in the hands of a special committee on transportation, one company member and one manufacturer member in general having been designated for each state.

The complete personnel of the committee follows:

H. J. Kenfield, chairman and representative for Illinois, *Electric Traction*, 431 South Dearborn Street, Chicago.

RAILWAY MEMBERS

Alabama, F. V. Underwood, Birmingham Railway, Light & Power Company; Arkansas, C. J. Griffith, Arkansas Central Power Company, Little Rock; California, W. V. Hill, California Electric Railway Association, San Francisco; Colorado, Ernest Stenger, Denver Tramway Company; Connecticut, J. K. Punderford, Connecticut Company, New Haven; Delaware, T. W. Wilson, Wilmington & Philadelphia Traction Company, Wilmington; District of Columbia, J. H. Hanna, Capital Traction Company, Washington; Florida, J. P. Ingle, Jacksonville Traction Company.

Georgia, F. L. Butler, Georgia Railway & Power Company, Atlanta; Indiana G. K. Jeffries, Terre Haute, Indianapolis & Eastern Traction Company, Indianapolis; Iowa, C. D. Cass, Waterloo, Cedar Falls & Northern Railway, Waterloo; Kansas, George Theis, Jr., Arkansas Valley Interurban Railway Wichita; Kentucky, Samuel Riddle, Louisville Railway; Louisiana, H. B. Flowers, New Orleans Public Service, Inc.; Maine, Alfred Sweeney, Androscoggin & Kennebec Railway, Lewiston; Maryland, L. H. Palmer, United Railways & Electric Company, Baltimore.

Massachusetts, Edward Dana, Boston Elevated Railway; Michigan, E. J. Burdick, Detroit United Lines; Minnesota, Vincento Law, Twin City Rapid Transit Company, Minneapolis; Mississippi, W. R. Phipps, Meridian Light & Railway; Missouri, B. W. Frauenthal, United Railways Company of St. Louis; Montana, E. J. Nash, Butte Electric Railway; Nebraska, R. A. Leussler, Omaha & Council Bluffs Street Railway, Omaha; New Hampshire, E. C. Foster, Manchester Street Railway.

New Jersey, H. C. Donecker, Public Service Railway, Newark; New York City, George Keegan, Interborough Rapid Transit Company; New York, W. H. Collins, Fonda, Johnstown & Gloversville Railway, Gloversville; North and South Carolina, Raymond Hust, Tidewater Power Company, Wilmington, N. C.; North Dakota, C. P. Brown, Northern States Power Company, Fargo; Ohio, J. H. Alexander, Cleveland Railway; Oklahoma, J. W. Shartel, Oklahoma Railway, Oklahoma City; Oregon, F. T. Griffith, the Portland Railway, Light & Power Company.

Pennsylvania, F. R. Phillips, Pittsburgh Railways; Rhode Island, R. R. Anderson, United Electric Railways, Providence; South Dakota, R. C. Mills, Sioux Falls Traction System; Tennessee, E. D. Reed, Tennessee Electric Power Company, Chattanooga; Texas, G. H. Clifford, Northern Texas Traction Company, Fort Worth; Utah, H. F. Dicke, Utah Light & Traction Company, Salt Lake City; Virginia, J. E. Harvell, Virginia Railway & Power Company, Richmond; Washington, R. A. Willson, Spokane United Railways; West Virginia, E. B. Moore, Monongahela West Penn Public Service Company, Fairmont; Wisconsin, S. B. Way, Milwaukee Electric Railway & Light Company.

MANUFACTURER MEMBERS

California, F. R. Fageol, Fageol Motors Company, Oakland; Connecticut, C. L. Hancock, Bridgeport Brass Company, Bridgeport; Georgia, P. M. Potter, Mutual Foundry & Machine Company, Atlanta; Kentucky, Carl P. Nachod, Nachod Signal Company, Louisville; Maine, N. E. Hodgkins, J. F. Hodgkins Company, Gardiner; Massachusetts, W. P. Underhill, L. C. Chase & Company, 89 Franklin Street, Boston; Michigan, M. J. Phelan, Peter Smith Heater Company, Detroit; Missouri, J. B. Spencer, Southern Wheel Company, St. Louis.

New Jersey, Joseph Kempf, Wilson Imperial Company, Newark; New York City, C. D. Eaton, American Car & Foundry Company; New York, E. P. Waller, General Electric Company, Schenectady; Ohio, W. P. Day, International Steel Tie Company, Cleveland; Pennsylvania, M. B. Lambert, Westinghouse Electric & Manufacturing Company, East Pittsburgh; Rhode Island, A. J. Thornley, Consolidated Car Fender Company, Providence; Wisconsin, J. R. Jeffrey, Allis-Chalmers Manufacturing Company, Milwaukee; Canada, W. W. Horwood, Canadian Steel Foundries, Ltd., Montreal, Que.

Experience with Buses

AT THE last American Association executive committee meeting, reported in last week's issue, some discussion came up about competition of buses. Britton I. Budd, president Chicago, North Shore & Milwaukee Railroad, said that the electric railways ought to go into the bus business if for no other reason than to meet fire with fire. He said that the worst thing about competitive bus lines is their effect on the ability of the railway to sell securities. He considered that the best protection is for the railways to operate buses and thereby prevent others from getting into the territory. Furthermore, if there is any need for this character of transportation let the railways provide it.

Mr. Budd said that the Chicago, North Shore & Milwaukee Railroad now has nearly half a million dollars invested in buses, though practically none of this business is profitable. But the interests of the North Shore road have been protected as most of the routes out of Chicago to the north have been supplied with bus service.

To determine whether there was any demand for a bus service paralleling the North Shore line between Chicago and Milwaukee, Mr. Budd bought five Fageol buses and advertised that three trips a week each way would be made. The traffic department devoted nearly its entire time for three weeks to solicitation of business for this service and at the end of that time had succeeded in securing seven passengers, the general comment being, "Why should we ride buses when there is good railway service?" These buses are now being used in special tours to Delavan Lake, Wis., and other resorts. There has been a call for this service such that about three buses a day have been dispatched on special tours. Mr. Budd reiterated that he doubted whether his bus business would be profitable, but it would at least protect the railway from others getting in.

Engineering Executive Committee Meets

A MEETING of the executive committee of the Engineering Association was held in New York on Aug. 23. Plans for the October convention were taken up in considerable detail. On account of the large number of committee reports to be considered, and the limited time available for discussion, it was decided that each speaker would be limited to five minutes. The committee expects to get considerable written discussion, and in order to save time it is requested that an abstract be furnished with each contribution which will give the principal points.

The committee on revision of the engineering manual made a progress report. It was recommended that a permanent bound volume be published within a reasonable time after the convention. It was also recommended that the committee on standards be relieved from direct responsibility for the

manual, and that the committee on manual should be made a standing committee composed of members of the executive committee, with authority to edit for publication the material submitted and prepare the makeup of the manual.

The program for the convention was next discussed. It was agreed that the subjects committee should not make a report after each session, but should prepare a complete report immediately following the convention. The various reports of the committees of the Engineering Association were discussed, and they were approved for publication upon recommendation of the sponsors for each committee.

H. A. Johnson was appointed a subcommittee to report on the policies of the heavy traction committee; E. H. Scofield to consider the work of the power generation committee; and C. R. Harte to decide on the question whether signals should be retained as a subject for the power distribution committee, or should be handled otherwise.

The secretary explained briefly the results of a conference called by Secretary of Commerce Hoover for the purpose of forming an advisory council consisting of representatives of the technical societies and trade associations in conforming specifications for governmental purchases of supplies.

A special committee was appointed to co-operate with the Bureau of Standards in work affecting electric railways, consisting of R. H. Dalgleish, C. S. Kimball and W. W. Wysor.

The activities of the American Engineering Standards Committee were reported on by Mr. Cram, who presented a memorandum on the relations of the Engineering Association to the A.E.S.C. The status of the work of the various sub-committees of the latter association, on which the Engineering Association is presented, was discussed. The entire proposal was submitted to a committee composed of Messrs. Cram, Harte and Hecker.

A committee on subjects to select suitable topics for next year's standing committees was appointed consisting of C. H. Clark, R. C. Cram, C. R. Harte, H. H. Norris and L. C. Datz.

It was reported that practically all the money has been contributed for the rail joint investigation. The committee is now awaiting bids from manufacturers to provide the equipment. Co-operation with the Central Electric Railway Association in its recent car braking tests was taken up, and it was decided to analyze and work up the results of these tests.

Requests for an alternate for the president of the Engineering Association at meetings of the executive committee of the American Association was taken up. President Datz announced that hereafter the alternates will be the vice-presidents of the Engineering Association in order of seniority.

Those present at the meeting were L. C. Datz, chairman; R. C. Cram, R. H Dalgliesh, D. Durie, C. R. Harte, C. H. Clark, H. A. Johnson and G. C. Hecker, who acted as secretary.

New Members of A.E.R.A.

THE last meeting of the executive committee approved the applications for membership in the American Electric Railway Association of the following companies—two railways and nineteen manufacturers:

Lake Superior District Power Company, Ashland, Wis.

Toledo, Ottawa Beach & Northern Railway, Toledo, Ohio.

Jerome Detective Service Company, San Francisco, Cal.

Portland Cement Association, Chicago, Ill.

Elliot Frog & Switch Company, East St. Louis, Ill.

Macbeth-Evans Glass Company, Pittsburgh, Pa.

Hoover Body Company, York, Pa. (bus and truck bodies).

Johns-Pratt Company, Hartford, Conn. (fuses and electrical protective devices).

Rubberset Company, Newark, N. J. (paint brushes).

W. S. Godwin Company, Inc., Baltimore, Md. (steel paving guards).

Southern Signal Company, Louisville, Ky. (track instruments and other railway signal appliances).

Federal Motor Truck Company, Detroit, Mich.

Graham Brothers, Detroit, Mich. (motor trucks).

Powers Accounting Machine Corporation, New York City.

N. A. Petry Company, Inc., Philadelphia, Pa. (automobile specialties).

Clark-Williams Engineering Company, Inc., Bridgeport, Conn. (pole supports).

Budd Wheel Company, Philadelphia, Pa.

National Malleable Castings Company, Cleveland, Ohio.

Wales Adding Machine Company, Wilkes-Barre, Pa.

New York Transportation Company, New York City (motor buses).

E. B. Badger & Sons Company, Boston, Mass. (Badger ball cushions).

Meeting of Purchasing Agents and Storekeepers

THE purchases and stores committee has been handicapped heretofore by the lack of a definite place at the convention, therefore the executives of the American and Engineering Associations have approved its request for a session at this year's convention to be devoted entirely to subjects of interest to purchasing agents and storekeepers. The program follows:

SESSION OF PURCHASING AGENTS AND STOREKEEPERS AT YOUNG'S MILLION DOLLAR PIER, ATLANTIC CITY, WEDNESDAY, OCT. 10, 1923 2 P.M.

Address of Welcome — President L. C. Datz, chief engineer Memphis Power & Light Company, Memphis, Tenn.

Report of Purchases and Stores Committee —B. J. Yungbluth, supervisor purchasing and supplies Philadelphia Rapid Transit Company, chairman.

Outline of Purpose and Constructive Work Planned by the Committee on Purchases and Stores—W. H. Staub, purchasing agent United Railways & Electric Company of Baltimore.

Proper Control and Handling of Materials and Supplies—P. F. McCall, superintendent of materials and supplies Chicago, North Shore & Milwaukee Railroad.

Convention Information

A CIRCULAR letter has been sent to all members of the American Electric Railway Association and affiliated associations by Secretary J. W. Welsh regarding plans made for the October convention at Atlantic City. With it are inclosed advance registration cards, indentification certificate for securing reduced railroad fares, copies of the proposed changes in the constitution to provide for the establishment of community section membership and for covering "no quorum" meetings of the executive committee, and an attractive leaflet entitled "All About the Forty-second Annual Convention." This folder gives a brief description of the various convention activities.

Special Reports Available

THE bureau of information and service, American Electric Railway Association, has prepared the following special reports, which are available to member companies in good standing upon request:

Cost of Living Studies.—A summary of reports of the National Industrial Conference Board, Bureau of Labor Statistics, Annalist Food Index, Gibson's Food Index, Dun's Wholesale Index and Bradstreet's Wholesale Index, showing present compared with prewar prices.

Protection of Railroad Crossings.—Part 1, laws of various states regarding elimination and protection of grade crossings; Part 2, court and commission decisions in cases involving apportionment of expense for the protection or elimination of grade crossings; local ordinances passed by cities regulating traffic over railroad and railway crossings; extracts from committee reports of the National Association of Railway and Utilities Commissioners.

Electric Railways Operating Motor Bus Lines.—A list of 107 electric railways that have adopted or propose to adopt motor buses or trackless trolleys either as auxiliaries or to supersede railway service in whole or in part.

Independent Motor Bus Routes.—A list of motor bus routes grouped according to geographical distribution, showing length of route, fare charged, number of buses operated and the type of bus.

Cost of Handling Materials and Supplies.—Gives the ratio of the value of materials and supplies on hand to gross revenues for a number of companies classified into three groups according to their size and their comparative stores department expenses (I. C. C. Account No. 95) per $1,000 of materials disbursed.

The Attitude of State Regulatory Commissions Toward Motor Bus Competition with Railways.—A study of the development of the policies of the various state commissions in regard to issuance of certificates of public convenience and necessity to motor bus operators.

Trend of Electric Railway Operations.—A month-by-month statement of the revenues, expenses, taxes, car mileage, passengers carried, operating ratio and average rate of fare of eighty companies since January, 1921, with charts showing the trend of the daily average number of passengers carried by these eighty companies since January, 1920, and the percentage variation.

Investment as the Basis of Rate Making.—A summary of court and commission decisions discussing the use of original investment as a measure of value for rate-making purposes.

Maintenance of Equipment

Painting Shop Interiors

THE maintenance shops of the Ohio Valley Electric Railway, Huntington, W. Va., are far from gloomy, but the management believes that liberality in the use of good paint on walls, under sides of roofs, and even machines will have good effect in increasing illumination and adding cheerfulness to its shops. Experiments have been going on recently to determine a satisfactory method of coating brick walls, roof trusses, etc., with white paint in such a way that the whiteness will be retained. It was found that paint of the ordinary type soon stains and takes on the appearance of antiquated whitewash.

At present, two coats of a special white paint made by the Detroit Graphite Company are being applied on rough brick and steel, with apparently permanently satisfactory results. On woodwork an "outside white" made by the same company is used. This paint is put on by the spraying method, with apparatus furnished by the Paasche Air Brush Company of Chicago, Ill.

An unusual and very attractive effect is secured in the machine shop by painting all of the machine tools red. A brightly colored machine in the white walled and roofed room produces a pleasing effect which is undoubtedly reflected in the quality of the work done. Whether the general neatness of the shop has anything to do with the good painting or not is a question, but there may be some connection.

Minimizing Lifting in the Storeroom

Convenient Device for Lifting Heavy Stock

THE Virginia Railway & Power Company is making improvements in its storeroom in Richmond, with a view to facilitating the taking of inventory and to handling materials more conveniently.

Among the materials-handling devices that have been found useful is the portable lift shown in the accompanying illustration. This is invaluable for raising materials to high bins or to a gallery. It consists of a platform sliding in guides and elevated by means of a steel cable passing over a sheave at the top and down to a drum, which is revolved by means of a crank through gearing. The lift is mounted on wheels and provided with a handle for pulling and steering. It is made by the Economy Engineering Company, Chicago, Ill.

Gear Cases Modified to Get Better Lubrication

LUBRICATION of railway motor gears and pinions is done ordinarily by placing grease or heavy oil in the bottom of the gear case. Sometimes sufficient grease is not placed in the gear case to insure good lubrication, and frequently some of the grease works out through the joints until the gear does not pick up enough to cover the teeth, leaving them dry. The result of the dry gears is excess noise and chattering, with resultant rapid wear.

A simple remedy has been provided by the West Penn Railways, Connellsville, Pa. This consists of cutting off the lower portion of the standard malleable iron gear case,

In the Shops at Huntington, W. Va., Unusual Care Is Being Given to the Painting of Walls and Other Reflecting Surfaces

and welding on a new bottom having a clearance of only about ¼ in. below the gear. This clearance has been found sufficient in practice, since there is no danger of loose parts falling into the case.

The result of this modification of the gear case is that the gear is lubricated so long as any grease at all remains in the case, and dry gears are unknown on the property. An incidental advantage is that the clearance between the track and the bottom of the gear case is increased several inches. As redesigned, the bottom of the gear case is above the bottom of the motor case, whereas in the standard design the gear case is the lower. This prevents damage to the gear cases, especially during the winter season, or when the paving has become broken and portions of it project above the general level.

A Dustproof Annex to the Paint Shop

IN ONE corner of its paint shop, the Chattanooga Railway & Light Company has built a dustproof brick and iron compartment or room for the painting of automobile bodies.

Fine Varnish Work Is Facilitated by Means of This Dustproof Room

Its appearance is shown in the accompanying illustration.

The brick part was built so as to include the two outside windows of the building, thus providing ample daylight illumination. For artificial lighting, powerful electric lights with reflectors were placed in such positions and at such angles as to give direct light on all parts of a job in process.

The roof was sloped so as to include the whole height of the windows without unnecessary height of the walls. It is of sheet iron, mounted on angle-iron rafters. The door is also of sheet iron, with a strong light framework of flat steel.

The room is wired in iron conduit. Steam radiation is provided sufficient to raise the temperature of the room above that of the shop.

New Equipment Available

Portable Bar for Boring Operations

A RECENT development in portable tools for railway shop use is the portable boring bar equipment just brought out by H. B. Underwood & Company, Philadelphia, Pa. Due to its light weight, compactness and the fact that it can be used in close quarters, this equipment is particularly useful for reboring motor housings and air compressor cylinders.

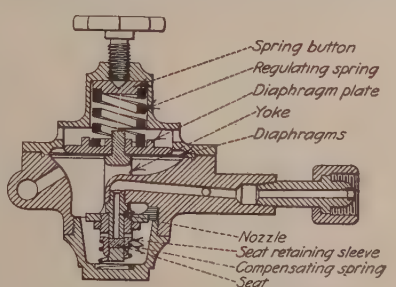
The boring bar equipment is of rugged construction and simple design involving few parts. The bearing plate carries a boring bar driving spindle and feed screw, mounted on a clamping ring, and a cutterhead. The pilot guide is screwed to the stuffing box and the bar placed in the cylinder. A clamping ring is securely fastened to the top flange of the cylinder by studs and nuts. Any inaccuracy in the position of the studs in the cylinder flange can be overcome by means of four thumb screws used for aligning the bar. The tool is adjusted and rigidly held in the cutterhead by tightening the collar screw which clamps the tool to the cutterhead by means of a simple clamp. The tool may be readily released when the cutterhead is at the lower end of the cylinder, if desired.

In boring cylinders the use of calipers is rendered unnecessary by use of a gage furnished with each bar. This provides a simple and practical method of setting the tool to the required position. In this manner a number of cylinders can be bored to accurate dimensions without loss of time.

The driving spindle is provided with a Morse taper shank to fit the air motor and drives a pinion which meshes with a gear keyed to the boring bar. A feed gear is keyed to the feed screw and meshes with a reverse gear journaled on a pin centered in the boring bar. The reverse gear turns freely on this pin, unless prevented by the feed pawl which holds the reverse gear stationary relative to the bar, and causes the feed gear to revolve the feed screw and advance the cutterhead into the work. To return the cutterhead to the top of the cylinder the air motor is placed on the shank of the reverse gear, which rapidly returns the cutterhead. The weight of an equipment for boring from 8½ in. to 11 in. diameters, without air motor, is approximately 140 lb.

New Line of Gas Welding Regulators

THE Torchweld Equipment Company, Chicago, Ill., announces a new line of welding and cutting regulators. One type, 2 in. in diameter, is fitted with a working pressure gage and with connections for cylinders or pipe lines. A second type, 2⅝ in. in diameter, is fitted with one working pressure gage and one gage for indicating cylinder pressure. This regulator is for use in oxy-acetylene cutting where the gases are delivered at their higher pressures. A third type, 3 in. in diameter, is fitted with either one working pressure gage or with two gages to show the cylinder pressure and



The Yoke Preserves the Alignment

gas delivery. This type is also fitted with connections for cylinders or pipe lines. A duplex regulator is also included in this new line. It is equipped with three gages, one for showing the oxygen cutting pressure, one the oxygen welding pressure, the third the cylinder pressure.

Regulators of this new line are fitted with three diaphragms of graduated sizes. These diaphragms are clamped into position between the regulator body and bonnet, and are held tight when the bonnet screws are tightened. The accompanying illustration of regulator details shows how the yoke holding the regulator seat is guided by the nozzle to preserve the alignment of these two parts. This construction is of advantage on account of the number of times that the regulator nozzle and seat are brought together.

New Model Truck Mounted Air Cleaner

A NEW model, truck mounted, electrically operated vacuum cleaner has been announced by the United Electric Company of Canton, Ohio. The entire equipment is mounted upon rubber tired steel disk wheels, and is marketed under the trade name of Tuec. In the construction of this new model particular attention has been given to lightness and ease of handling. It has a small wheelbase, which permits ready operation through restricted aisles and narrow doorways.

New Model Truck Mounted Air Cleaner

Where it is necessary to transport it from floor to floor it can readily be carried or placed in a small elevator. The regular set of tools furnished consists of flexible hose, aluminum tools and extension handles which afford easy access to bins, shelving, ceilings, walls, etc., which are ordinarily beyond the reach of the cleaner without the use of a stepladder. The portability of the outfit makes it suitable for cleaning car interiors, including seats and fittings.

The equipment is driven by a universal motor of 3-hp. capacity at 5,000 r.p.m. Motors are furnished for use either with 110 or 220 volts. A fan is attached to the lower end of the motor shaft, which has wide clearances and handles a large volume of air at high velocity with low power consumption. One dry separator is used. There are no water sprays, fine screens, by-passes, or appliances to reduce efficiency in construction, gravity alone being used in the separating medium.

One metal screen of coarse mesh is placed in a separating tank, which deflects the dirt from the fan. Two leakproof dust bags are mounted in the rear for air separation of finer dust which drops into the lower dust bag for ready removal.

A removable dust pan of ample capacity is provided in the bottom of the separating tank to catch the heavier dust and dirt deflected by the screen. A large door at the bottom of the tank gives easy access to this tank. There are but two bearings and these are of a high-grade, self-aligning ball-bearing type. The net weight of the new Tuec model is 280 lb., and it has an over-all height of 48 in., a width of 30 in., and a length of 36 in. The wheels are 30 in. in diameter.

Bringing Electrical Repairs to the Job

THE increased use of electric power for driving shop machinery has required a supply of fuses, motor brushes, wires, switches, etc., for maintenance repairs. Trouble at any point frequently requires several trips back and forth between the point and the electrical repair department, and sometimes the transporting of heavy motor parts.

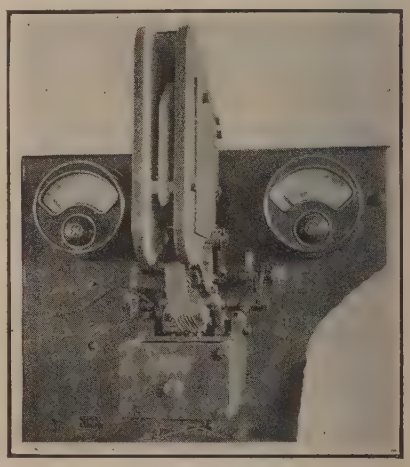
The Elwell-Parker Electric Company, Cleveland, Ohio, has taken a cue from these conditions to provide an electric industrial truck suitable for carrying necessary repair parts and provision for making repairs. As will be seen from the illustration, a steel and wood case occupies about two-thirds of the platform, while the balance is reserved for a motor and tool kit, with room for one or two repair men to ride. A pipe vise is mounted on a partitioned rack to enable the making of repairs.

The truck is driven by a battery carried in a compartment over the large rubber-tired drive wheels. The operator can drive the truck and usually deliver necessary material right at the job, since it steers on all four wheels.

The truck cannot be started unless the operator is on the pedals, and the truck will stop within its own length if he steps off. The outfit is a valuable adjunct to the maintenance of electrical equipment in shops of sufficient size to warrant its use.

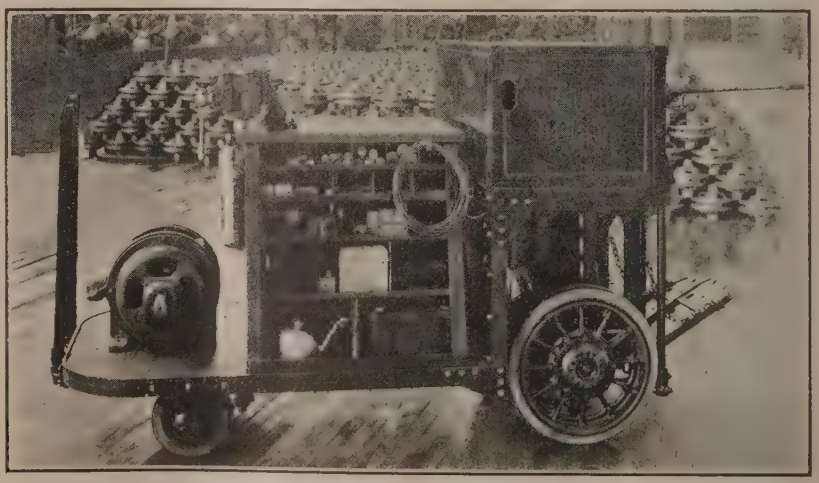
Counting Breaker Operations

THE number of operations performed by the various opening and closing devices on automatic switching equipment is being recorded in an interesting manner by means of a standard Veeder counter



Device for Recording Breaker Operations

on installations which have been made recently by the General Electric Company. The illustration shows one of these counters connected to the circuit breaker mechanism of an automatic reclosing equipment. It will give an accurate record of the number of times this breaker opens or closes. By installing counters in connection with relay, contactors, etc., a complete check of operation may be shown which will lead to locating any faults.



Tractor Used for Carrying Maintenance Repair Parts

The News of the Industry

$1,000,000 for New Work

Railway at Fort Wayne Forging Ahead —Story of Improvements to Be Told to Public

Fifteen new double-truck front-entrance and rear-exit cars, being manufactured in St. Louis at a cost of $12,000 each, will be placed in service on Oct. 1 by the Indiana Service Corporation on its lines in Fort Wayne. These will be the first new front-entrance and rear-exit cars purchased for the Fort Wayne city lines for some time, as 80 per cent of all the cars operated on the Fort Wayne city lines are of the one-man type with both entrance and exit at the front.

The addition of the fifteen new cars to the Fort Wayne city lines will complete an expenditure of nearly $300,000 for new car equipment for the city of Fort Wayne as the Indiana Service Corporation last spring purchased for Fort Wayne fifteen one-man cars at a cost of $7,800 each.

The city is growing fast and its rates of four tickets for a quarter and the sale of weekly passes for $1 each account very largely for the need for the new equipment. At the present time the company is selling about 5,500 passes a week. This summer-time sale of passes compares very favorably with the peak sale of 7,600 passes a week which occurred in one week in March last.

$500,000 for Power Improvements

In addition to spending nearly $300,000 for new cars the Indiana Service Corporation is completing improvements at its power plant and carhouses totaling more than $500,000. At the power plant a 12,000-hp. turbine is now being installed. In recent years two 6,000-hp. turbines have been put into the plant. Ten years ago there were only two turbines of 1,500 hp. each. The new carhouse next to the power plant is going up at a rapid rate. It will cost more than $200,000.

The company has just completed the double tracking of South Calhoun Street at a cost of $77,000 and is preparing to begin double tracking Pontiac Street and extending the line to the International Harvester Company's plant at a cost of about $150,000. In addition to this a franchise has just been granted by the Board of Public Works at Fort Wayne for a double-track line on Lafayette Street. This will give the corporation another line to the fast-growing south side of the city.

In addition to making all these improvements the Indiana Service Corporation is going deeply into the problem of "selling" all these additions to the general public. It is felt by officials that the public should be told about the things in an interesting and entertaining way so that a deep and lasting impression may be made. It is believed by the traction officials that the institution of the weekly pass had much to do with improving the feeling of the public toward the company. While the average man may not actually ride more during the week now than he did formerly, still he knows that there is no limit to the amount of riding he can do and he accordingly feels that he is getting his money's worth for his purchase. This desire on the part of the corporation to tell the public what it is doing has led it to institute a rather extensive publicity and advertising campaign, which is to be put in charge of a man hired expressly for the purpose of handling it.

Public to Be Told

Some of the stories which are to be prepared and printed have already been outlined. For instance, one of them is to be a story of what has been done underground at the power plant. This story will carry a diagram or map showing the underground activities and will tell how long it took to carry through the various portions of the work and just what was accomplished by the work. Another story will tell about some electric switches which are to be installed at the main transfer corner at the corner of Main and Calhoun Streets. And so on.

It is also planned to use a double-page spread in the local papers at the time the new cars are put in service, and the principal feature of this advertisement will be a drawing showing an exterior view of the car and another drawing showing the seating arrangement and indicating just how the car will be operated, where the fare will be paid and how the rear exit will be operated. Also there will be a list of the lines on which the cars will be run, together with a complete timetable showing the schedule for the various lines.

Letters will be sent out to all the auto owners in the county when the new cars are placed in service telling them to watch for people alighting from the rear ends of the cars instead of at the front ends.

The company is now using car cards regularly for the purpose of "selling" its service to the public and is also going to put on an anti-jay-walking campaign.

J. Allen Greenland, superintendent of transportation, has direct charge of the company's publicity work.

Directors Named

Financing Plan of Saginaw Transit Company Before the Public Utilities Commission for Approval

Six of the nine directors of the Saginaw Transit Company who will govern the affairs of the company that will furnish street car-bus transportation under the terms of the franchise that was approved by the electors on June 25 have been named by the Mayor and two local circuit judges. Those who will finance the new company have approved them. They are: A. A. Alderton, secretary and treasurer of a wholesale grocery company; Charles C. G. Christensen, proprietor of a general store; Henry T. Robinson, cashier of a local bank; William C. Wiechmann, proprietor of a department store; E. Walter Secord, business agent for the carpenters' union, and John Troy, general foreman of boilers of the Père Marquette Railroad, where he has been employed for forty years.

The company's three men have not been named. The selection will be made without regard to the city.

Financing Before Commission

Financing of the company is now before the Michigan Public Utilities Commission. The petition was filed and testimony was taken by the commission Aug. 30, and an early decision was promised by the commission. It is expected that the plan of financing will be approved and immediately afterward the temporary organization that has been at work will then resign and the new directors, who will be permanent, will then take office.

The franchise provided that the directors could serve only after two-thirds of their number had the approval of the Mayor and two circuit judges. After many conferences these officers presented the company representatives with the six men they would approve, which apparently was satisfactory to all concerned.

This action is contrary to the expectations of those who during the last two years fought the return of street cars in Saginaw. They asserted time and time again that such a proposal was only made to catch votes and those who would finance the project could not be expected to allow outsiders to operate their business. But this apparently is just what has occurred and the announcement of the personnel of the board has created considerable comment locally as it is entirely different from what was expected. One thing is certain, the city's members are all friendly to the cause of street cars.

Conditions Existing Along the Bamberger Electric Line Right After the Flood

Floods in Utah

As a result of a terrific thunderstorm and cloudburst which struck the canyons east of Farmington and Willard, Utah, on the evening of Aug. 13 several lives were lost and many thousands of dollars worth of property destroyed.

At Farmington, which is on the line of the Bamberger Electric, about half way between Salt Lake City and Ogden, a wall of water estimated to be between 20 and 30 ft. high rushed down the canyon, drowning seven persons and depositing many hundreds of tons of boulders, mud and débris across some of the farms in its path and completely blockading the state highway and the tracks of the Bamberger Electric. It required forty-eight hours of unceasing labor on the part of some of the railroad company's employees to clear the tracks. For several days thereafter the electric road was the only means of transportation, its facilities being used to good advantage in relieving flood sufferers, in the transportation of passengers, supplies, etc.

At Willard, Utah, about 30 miles farther north, on the line of the Utah-Idaho Central, similar conditions were brought about as a result of the heavy storm. There two lives were lost and much property destroyed. After the tracks of the electric road were cleared its trains were the only means of transportation until the state highway could be cleared, and the right-of-way of the railroad was offered and used as a highway for automobile traffic for two hours each day.

Substantial recognition of their services in this emergency was received by about twenty employees of the Bamberger Electric Railroad. These men, ranging from superintendent to section foreman, were working on a monthly basis for the railroad. During and after the flood in the vicinity of Farmington they worked early and late to get the road in running order. They had no reason to expect any overtime or other compensation and were agreeably surprised when they received personal letters signed by former Gov. Simon Bamberger, chairman of the board of directors, enclosing checks as rewards for faithful services. The men working on a daily basis were paid for all the overtime they put in.

The letter from Mr. Bamberger to the men read as follows:

> Your extraordinary efforts in assisting in getting our line open to service after the terrible catastrophe of Aug. 13 are very much appreciated, and I am pleased to enclose a more tangible expression of our thanks.

A Tribute to Warren G. Harding

Electric railways throughout the country joined in paying tribute to our deceased President on Friday, Aug. 10. In many cases the operation of trains and cars was suspended for a short period at the time services were being conducted in Marion, and in some cases passengers on cars were requested to join with the employees in observing the day. Company publications, in many instances, paid a tribute to the Chief Executive, reviewing his achievements as a leader and as a man. An instance of the extent to which some companies went in paying tribute to the late President was evidenced by the exercises undertaken by the Eastern Massachusetts Street Railway.

At the Fall River district cars were run on Sunday time and the offices were closed. The cars stopped for a minute at 5 p.m. and all operators bowed their heads. All passengers on the cars at that time were asked to join with the operators in standing, bowed and silent, for one minute. In addition to these exercises one of the greatest factors in keeping before the minds of the people the significance of the day was the placing of dasher signs on both ends of every car carrying the picture of the late President.

A Semblance of Order Being Restored After the Flood

Trackless Trolley for Rochester

Ordinance Passed by Council for Operation of Trackless Cars for Four Months Trial

An ordinance authorizing the operation of trackless trolleys on a crosstown route in the city of Rochester, N. Y., for a four months trial period was passed by the Common Council on Aug. 28. The ordinance permits the Rochester Railways Co-ordinated Bus Lines, Inc., to operate the route from Sept. 5 to Jan. 5, 1924. The bus company is a subsidiary of the New York State Railways.

Considerable agitation has resulted from the opposition of certain residents of the section to be traversed by the line, who have appealed to the city for gasoline buses instead of the trackless cars.

James F. Hamilton, president of the New York Railways, declares that if the trackless trolleys prove unsatisfactory at the end of the trial period, crosstown service will be abandoned and the trolley buses removed to Utica and Syracuse, which cities, he says, would be very glad, indeed, to have this service. It is his belief, however, that after a trial under the limited franchise, the new trackless car line will prove to be not only more economical but also entirely satisfactory from the service point of view.

It is expected that the line will begin operation within the next few weeks.

The route will traverse the northern section of the city and will provide crosstown service, connecting the parts of the city on the opposite sides of the Genesee River, by way of Driving Park Avenue bridge. It will serve a rapidly developing industrial and residential section.

At the same meeting of the Council, the law and finance committee recommended a judicial review of the appraisal of the property of the railways in Rochester under which the service-at-cost contract, now in operation, was formulated.

Seattle Trainmen No Longer on Monthly Basis

Trainmen of the Seattle Municipal Railway have lost their fight to keep their wages on the monthly basis, but the City Council has voted to recommend the establishment of "one day off in eight" without pay for trainmen. Representatives of the union appeared before the Council to discuss further the request of the trainmen for an increase to 68 cents an hour from the 66 cents recently voted by the budget committee, but the request was denied.

Rates of pay were fixed by the Council at 56 cents an hour for beginners, with a pay of 63 cents an hour at the end of the second year and a maximum pay of 66 cents an hour. Former rates of pay were 56¼ cents an hour for men while learning, a rate of 60½ cents an hour at the end of the instruction period, 62½ cents an hour at the end of the second year and a maximum of 64¾ cents an hour.

The budget committee states that the change in pay and one day off in eight will make no difference in the budget. Request of the shopmen for slight increases were granted in some instances, but the request for a two weeks vacation with pay was denied.

D. W. Henderson, superintendent of the railways, will be officially instructed to train sufficient men to relieve the platform men on their day off. It is estimated that the number needed is 150.

New Wage Contract Signed in St. Louis

A new wage agreement has been entered into by the receiver of the United Railways and the Amalgamated Association, whereby first year motormen and conductors retain the pay of 50 cents an hour, a raise from 55 to 56 cents for second year men, a raise from 60 to 62 cents for third year men and a raise from 65 to 67 cents for older employees. The men had asked 55, 60 and 65 cents.

Shop and carhouse employees received advances ranging from 2 to 6½ cents an hour.

Only minor changes were made in working conditions under the renewed annual contract, which is retroactive to July 1.

About 5,000 men are affected by the contract, but only 1,225 attended the union meetings and voted on it on Aug. 27, the contract being ratified by 1,031 to 194.

Columbus Railway Believes Perpetual Franchises Benefit City

In an effort to present the facts and to dispel misinformation, the Columbus Railway, Power & Light Company, Columbus, Ohio, has recently issued some advertising matter which calls the attention of the public to the desires of the company to give the best service possible. The company says that it wants to be considered as a part of and not apart from the community. The matter of the perpetual railway contracts in Columbus is explained fully in the advertisements giving the history of the making of these contracts, which were started some fifty or seventy years ago. The advertising by the company is its answer to the moves under way looking toward a surrender of the perpetual franchise. Against those who are opposed to perpetual franchises the company champions this method of contract. It claims that it has been able to borrow money at a lower rate of interest than many other similar companies in the country because of its perpetual franchise. Further, that it has enabled the company to operate on extremely low rates of fare, the present rate of fare being nearly 40 per cent less than the average rate of fare in all the larger cities of the country, besides giving a free transfer. The company contends that it has not sought, or will not seek, in any way to take advantage of the public, but believes that the public, when fully informed, will act fairly toward the company.

Another Railway Adopts the Bus

Over at the Fair Grounds in Brattleboro, Vt., are five street car bodies. Removed from their trucks they are being used as ticket selling stands and concession booths. Up to Aug. 28 the bodies mounted on their trucks were in regular service in that city transporting passengers for public hire. The following day the lines over which the cars were run were thrown in the scrap heap and the new motor bus line began operating for the first time. The buses ran at thirty-minute intervals, an improvement of ten minutes over the street car schedule. The tracks, which have served the public for thirty-five years, with the trolley wires and poles will be removed soon. The railway has promised to place the roadbed previously occupied by it in as good shape and condition as the adjacent roadbed. An investment of about $27,000 has been made by the Twin States Gas & Electric Company in establishing the bus line, and $7,000 more will be expended in the building of a suitable garage to house the vehicles.

Vancouver Men Seek Ten per Cent Increase

Platform men of the British Columbia Electric Railway, Vancouver, B. C., recently requested a 10 per cent increase in wages, reinstating the terms of the agreement prior to January, 1922, when the company obtained a reduction. A conciliation board is now sitting, consisting of A. M. Pound, a local broker, as chairman; A. G. McCandless, representing the company, and R. P. Pettipiece, representing the men. This board, appointed under the industrial disputes act of Canada, has no power of enforcing its findings upon either party.

Among the requests of the men is one for a modification of the working conditions. They claim that since overtime rates were reduced from double time to time and a half, the company has increased its use of men in overtime hours considerably. This the company denies. The reinstatement of the 10 per cent is asked on the basis of the alleged advance in the cost of living. The added strain of work with the increase in traffic on streets is also cited as a reason for higher wages. Another request is to have four motor bus operators included in the union. Protests were made by the men's representatives that the company used non-union men in its construction gangs and paid lower wages than were paid civic gangs. On a recent job, rushed through by the company on a main thoroughfare, the union representatives claimed that "slave-driving conditions" obtained. On the other hand, the company had obtained credit for performing the work efficiently and expeditiously.

Test of Endurance

Public Officials in New Jersey Cite Railway for Contempt of Alleged Contractual Obligations

Moves made in the last few days on the part of various public authorities in connection with the suspension of railway service in New Jersey have been of a punitive rather than a conciliatory nature. There have been several moves on the part of public officials toward placing both the Public Service Railway and the Public Service Railroad in receivership, but the hope behind these actions appears to lie in so-called technical default of their public obligations by the companies rather than for financial reasons. The proceedings involving the railroad and the railway are entirely different in nature. One has in mind a direct receivership for the railroad, while the other has in mind ultimate receivership for the railway if *quo warranto* proceedings fail. So far as the company is concerned it is still resting its case on the basis of its settlement offer.

The idea behind the attempt to bring about receiverships is that this would bring resumption of service under the direction of the court. The proposed actions against the two companies, as noted previously, are to be brought on different grounds, but they have for their object the same thing, namely, resumption of railway service. This is, in fact, the insistent cry nearly everywhere throughout the State, but the very insistence of the municipal authorities on their program that service be resumed first and terms of settlement then be discussed has not advanced matters a step so far as the principals to the controversy are concerned.

On its part the Board of Public Utility Commissioners, in replying to the railway's statement filed in the mandamus action seeking to compel the company to resume, contends that the attack upon the board by the company contained in its answer is entirely immaterial and plainly designed to cloud the issue. The board says that the sole question at issue is whether it is practicable, under the rate fixed by the District Court of the United States, for the company to afford service to the public pending an adjustment of its present difficulties. It regards the refusal of the company to resume service as an effort to club the public into accepting a demand arbitrarily made as a condition upon which it will resume. The board says that the company's statement is absolutely false that the commission has approved licenses for buses to operate in unlawful competition with the railway. In conclusion the commission says that the answer of the company in the mandamus action brought by the board does not meet the issue before the Supreme Court, viz., whether it is practicable to supply service.

This briefly summarizes the board's answer to the railway. On its own part the commission has instructed its counsel to petition the United States District Court to dismiss the pending proceeding under which the railway was empowered to put into effect a base rate of 8 cents. The legal grounds upon which this move is predicated are that the company has ceased to operate and that it has submitted a plan of settlement involving a fare lower than that allowed to the railway in the federal litigation. The commission says in short that the company's plan of settlement involves placing the problem of rates upon a new basis and constitutes an abandonment of the remedy it sought in the Federal Courts.

Early in the week it appeared that in Camden, where the buses charge a 7-cent fare, there might be an early separate peace with the company, but these hopes were not realized.

In Newark City Commissioner Raymond has issued emergency permits for 200 omnibuses. These permits, which are for six months duration, will be considered by the Public Utility Commission on Sept. 11.

Most of the newspapers in their editorial comments emphasize again and again that in reality the cities and the company are not really so far apart on the fundamental matters contained in the plan of the company, but despite this seeming nearness the matter appears at this writing to have reduced itself to a test of endurance.

The Electrical Trade Tie-in with the Jersey Shutdown

How the electrical trade in New Jersey is interested in bringing a settlement of the transportation situation in favor of the railway, and why all parties in the electrical trade should support the railways' plan, are brought to the attention of the trade by the following statement. It appears in *Nelectra-Grams* published by the Newark Electrical Supply Company:

> Street car development kept pace and kept ahead of the other economic development of the state until jitney competition undermined the structure of the street railway system. Where street car systems create values, jitney lines merely cash in on existing values. There is no doubt but what there is a practical place for jitneys in the transportation system of New Jersey, but jitney transportation is only a constructive factor in the economic development of the territory if it is operated in conjunction with, and in co-operation with, and completely co-ordinated with the street car system.
>
> The plan of settlement of the transportation crisis as submitted to the State Board of Public Utility Commissioners by the Public Service Railway Company, is of such character that it provides fair consideration and fair compensation to all parties concerned. It is reported that the striking street railway employees have endorsed the plan substantially as submitted. Every thinking citizen of the affected communities cannot help but be in favor of it. It is up to the public to convey to the Public Utility Commission its opinion on the subject.
>
> You are asking just why all this from an electrical supply house. Here is the answer: The Public Service Railway Company is an integral part of the Public Service Corporation. Jitney competition during the last few years built up increasing deficits in the cost of street railway operation, which deficits had to be paid out of the pockets of the Public Service Electric Company. A self-sustaining railway company means that the electric company can devote its funds to developing electric power houses and transmission lines. The more transmission lines and the easier it is for the householders and home owners to buy electric service, the more houses will be wired; the more appliances will be sold, and the better will be the business of every electrical contractor-dealer.
>
> As a matter of self-preservation, you should support the Public Service Railway Company in its efforts to secure a basis of operation which will protect its thousands of stockholders against loss, and enable the Railway Company to be self-sustaining. Before you put this *Nelectra-Grams* aside, write the Public Service Railway Company, telling them that you consider their plan of settlement fair, and that you are endorsing the basic principles conveyed in that plant. By so doing you will help the electrical industry in this territory which can only prosper in direct proportion to the way that Public Service Corporation prospers.

Few Casualties Among American Business Men in Japan

Nobody knows the real extent of the damage done by the earthquake and fire in Japan. The loss of life and property damage are appalling in their extent, but the later accounts of the disaster indicate the first reports, particularly those relating to the estimates of the loss of life, were exaggerated. In the electrical trades the principal companies doing business with permanent representatives abroad were the General Electric, Westinghouse and Western Electric.

The General Electric Company has received a cablegram from that country saying that all its representatives are safe, although some were injured. With their families the General Electric men, who escaped in a boat from the scene of destruction, are now on their way back to the United States. The company had about fifteen Americans stationed in Yokohama and a smaller number in Tokio.

The Westinghouse company has received a cable from Shanghai saying that its Japanese representatives are safe. The company had about six men stationed in Japan, four at Tokio and two being engineers engaged in installation work.

The Western Electric Company has been unable to get any direct word from its employees except a cablegram from Kobe relating to its comptroller, E. S. G. Elliott, and his family, who are safe. A newspaper dispatch published on Thursday said that W. T. Blume of the General Electric Company had been killed. Mr. Blume, however, was a Western Electric Company man. The Western Electric Company operated a factory in Tokio employing 1,200 operators with a staff of four Americans, but the district in which this plant was situated was practically undamaged. P. K. Condit, vice-president of the International Western Electric Company, was expected to arrive in Tokio on the day of the earthquake, and considerable anxiety is felt as to his safety.

So far as the property damage is concerned, the extent to which the public utilities have suffered will necessarily not be known for some time as all the present efforts toward restoring order are entirely of a temporary nature, having for their first aim the lending of succor to the suffering.

Foreign News

French Company Will Extend Lines

The Compagnie Générale Française de Tramways, which operates street car lines in four chief provincial cities of France—Marseilles, Nancy, Le Havre and Orleans—is increasing its capital from 50,000,000 francs to 75,000,000 francs. The increase was made necessary by conventions passed recently with the municipalities of Marseilles and Le Havre, where in each case it had been agreed to develop various suburban lines. It is to be remarked that interurban electric railways are something scarcely to be noted in France save in the contiguous Lille-Roubaix-Tourcoing district, largely intermarried industrial communities where there is an intense interchange of traffic.

Above all, the situation in Marseilles is one that requires as early a solution as possible. The city is extending its habitable limits far beyond that reached by the street car lines and with the exception of the intercity lines running to Aubagne on the east and to Aix-en-Provence on the north, 12 or 15 miles in each case, there is practically no catering to suburban traffic. Accommodation by the single line of railway centering at Marseilles, the Paris, Lyons & Mediterranean, which is only just beginning its electrification program, is wholly inadequate with respect to its Marseilles suburban stations and in fact does not reach many outlying communities, which are entirely bereft of any means of public service communication. The municipality of Marseilles is to advance the company 40,000,000 francs for the immediate undertaking of the required extensions, while Le Havre is to advance 10,000,000 francs for work to be carried out there.

Profit Sharing in Public Service Concessions in France

The permanent Council of Labor, recently in session, passed a motion calling upon national, state and county authorities to grant franchises for public service concessions—light railways, heat, light and power, omnibus routes, gas companies, etc.—only upon the acceptation of a clause which shall provide for the sharing of profits with employees of whatever rank who may be associated with the enterprise. It was recommended that a law be passed by the national government to this effect and that this law should state clearly the conditions under which such profit sharing should apply, flexibility of the law, in the sense that it would permit the directors to take advantage of the means to widen the scope or increase the volume of business, being as desirable for the employee as for the employer. The platform appears to have been most liberally conceived and is in no way to be considered as antagonistic to capital and employer as being the concurrent elements to the employee.

Electrification of Finnish Railways Progressing

According to the director of the Finnish State Railways, the question of the electrification of the State railways, which has been in abeyance for some time, will soon be taken up, as the work on the power station at Imatra has advanced so far that preliminary arrangements have already been made for obtaining turbines and power machines. The State Railways must therefore hurry this matter forward. It is intended to electrify first the local lines near Helsingfors and then the long-distance line, particularly Helsingfors-Systerback. The project, however, is still very indefinite.

First Important Electrification in Central Africa

The Department of Commerce at Washington has received from Consul-General H. M. Morgan of Brussels the statement by the Belgian Minister of Colonies on the electrification of the Leopoldville-Matadi Railroad. According to his statement this will be the first important railroad in Central Africa to be electrified. For the electrification of the railroad 30,000 hp. will suffice, at least in the beginning. It is estimated that the money required for this project will be 150,000,000 francs. The gage of the line is at present 75 cm. It is impossible, for technical reasons, to electrify the line efficiently unless the gage is made at least 1.06 m. "Consequently," says the statement, "the widening of the lines will have to be undertaken before any other work is begun."

Electrification in Sweden Extensive

Electric power is furnished to 40 per cent of the total area of Sweden, according to the Government Committee for Information on Electrified Acreage. The present annual consumption of electric power by rural Sweden is 110,000,000 kw.-hr., while the total consumption of the country is approximately 390,000,000 kw.-hr. This committee has reported also on the possibility of electrifying the island of Gottland off the west coast of Sweden and recommends the establishment of a plant near the town of Tingstade, where large deposits of peat would afford cheap and satisfactory fuel.

Private Operation Being Considered in Milan

Reversion to private operation of the Milan tramway system will be discussed before the Municipal Council of that city. Although a surplus will be earned this year, the general feeling is that utilities had better be operated by private companies because they are then less affected by politics. The example of the municipal electric light and power service of Milan, which from a very successful undertaking had been brought to the verge of ruin by the former socialistic city administration, is recognized by the public, who compare its rather irregular service with the much better and more reliable Edison service.

The only consideration that is adverse to a return to private operations is that a company would not perhaps consider building extensions unless these should appear to show an early profit, and new street railway lines are necessary to the growth of Milan, which now has more than 750,000 inhabitants within its corporate limits.

The street railway tracks in Milan are generally in very good condition and so are the cars, though many are of small capacity and somewhat obsolete in type. Fares, which are straight, are 40 centesimi during the day (about 2 cents at actual exchange) with return tickets sold for 40 centesimi before 9 a.m., entitling to a return trip in opposite direction within the same day after 9 a.m. The municipal tramways system consists of about 1,300 cars operated over forty different routes.

Will Extend Weekly Pass

The weekly pass has proved so popular from a public and operating standpoint on the Lidget Green route of the Bradford Corporation Tramways, Bradford, England, that it has been decided to extend the plan to other routes at an early date. The revenues for the first four weeks, beginning June 18, on the test route were respectively £546, £556, £557 and £557, while pass sales at 2 shillings (48 cents) per pass were 897, 950, 941 and 923. The additional routes for two months trial are Thornton, Allerton and Duckworth Lane. The last named will have the same price pass as Lidget Green, since it is also a single fare 1.5d. (3 cents) route. The others will have a two-zone pass in addition, at a price yet to be determined.

Fares on Gold Basis

A car ride in Cologne now costs 33 gold pfennigs, in contrast to the rate of only 10 pfennigs before the war. Fares are now determined on a gold basis, in order to protect the city against losses resulting from the depreciating paper mark. It is said now that an electric railway ride has come to be considered a real luxury for the average man, who is paid his wage in paper marks.

Financial and Corporate

Net Income Up $490,497

Brooklyn City Railroad's Report for the Year Shows the Company to Be Making Remarkable Record

The gross revenues from transportation of the Brooklyn City Railroad for the year ended June 30, 1923, increased approximately $300,000 during the year, with no increase in fares, the average receipts per passenger being 4.68 cents. There was an increase of approximately $30,000 in the cost of operating cars, due to increased service and to the higher wages paid the employees.

The net corporate income of the Brooklyn City Railroad (excluding the Brooklyn City Development Corporation), after providing for all operating expenses, maintenance, taxes, bond interest and reserves, amounted to $2,256,025. This was an increase of $490,497 compared with the previous year.

INCOME STATEMENT
BROOKLYN CITY RAILROAD AND BROOKLYN CITY DEVELOPMENT CORPORATION

	Consolidated Fiscal Year Ended June 30, 1923	Brooklyn City Railroad only Fiscal Year Ended June 30, 1922
Passenger revenue	$11,715,813	$11,413,403
Other car revenue	150	247
Total transportation revenue	$11,715,963	$11,413,650
Advertising and other privileges	$85,872	$100,006
Rent of land, buildings, etc.	131,660	127,498
Rent of tracks and terminals	50,753	46,053
Miscellaneous revenue	2,004	543
Total operating revenue	$11,986,252	$11,687,750
Operating Expenses		
Maintenance—way and structures	$1,246,178	$1,203,976
Equipment	1,404,315	1,368,204
Power	1,023,282	986,910
Operation of cars	3,865,305	3,835,850
Injuries to persons and property	419,436	524,309
General and miscellaneous expenses	512,592	530,972
Total operating expenses	$8,471,108	$8,450,221
Net operating revenue	$3,515,143	$3,237,529
Taxes assignable to operation	889,532	931,521
Operating income	$2,625,611	$2,306,008
Non-operating income	210,942	160,950
Gross income	$2,836,553	$2,466,958
Income Deductions		
Interest	$367,454	$428,319
Rent of cars, tracks, etc.	213,884	273,111
Total income deductions	$581,338	$701,430
Net income	$2,255,215	$1,765,528

During the year the company carried 250,700,975 passengers, an increase of 7,162,508 passengers as compared with the previous year. Expressed in another way, the company carried approximately 100,000 more passengers on every business day of the year ending June 30, 1923, as compared with the period ending June 30, 1921.

During the year the company expended for maintenance or credited to the reserve therefor $2,606,640, thus adequately meeting all current maintenance in addition to providing for the deferred maintenance which had accumulated at the time the property was returned in October, 1919.

The company is now engaged in the reconstruction of 68,760 ft. of track system, the old 94-lb. rail being replaced with new rail weighing 122 lb. per yard.

The payment of dividends on the stock of the company was resumed during the year. Three quarterly dividends of 2 per cent each were paid respectively on Dec. 15, 1922; March 1 and June 1, 1923.

In view of the increased earnings and the resumption of dividends, the directors determined in November, 1922, to suspend the collection of a second fare on the Flatbush Avenue Line at Foster Avenue. This and the generally better and more frequent service given have enabled the public to share with the company the results of its prosperity.

The Brooklyn City Development Corporation, all of the capital stock of which is owned by the Brooklyn City Railroad free and clear of liens of any kind, has contracted for the delivery in the early autumn of 200 new passenger cars of the most modern type. The company is also converting fifty-four center-entrance trail cars into motor cars, traffic conditions being such that the public can be better accommodated by more frequent service of single motor cars than by the operation of cars and trailers at longer intervals. Seventy-five semi-convertible motor cars have been rebuilt into prepayment one-man two-man cars and are now rendering satisfactory service. This has enabled the company to dispose of twenty-five of its small single-truck safety cars that were no longer needed.

Operation to Cease in Trinidad

After requests covering three years, the Trinidad (Col.) Electric Transmission, Railway & Gas Company has been granted permission to discontinue all its city and interurban railway lines by the Colorado Public Utilities Commission. The decision was announced on Sept. 1. Cessation of service will be permitted after Sept. 15, thus cutting off Sopris, Cokedale and other large coal mining camps in the southern part of the state.

Discontinuance was originally requested by the company on May 10, 1920. The application was renewed in November, 1921. Hearings on the last request were started in May of this year when it was shown that the company had lost more than $22,000 in 1922. The abandonment was opposed by the city administration in Trinidad, the Chamber of Commerce and other civic organizations.

According to W. P. Southard, general manager of the company, it is not known whether the trackage will be torn up or be allowed to remain pending a period when operation might again be made profitable.

Passengers and Net Income Decrease in Detroit

The total operating revenue of the City of Detroit, Department of Street Railways, for July, 1923, was $1,764,174 compared with $1,584,795 for the same month a year ago. Included in the first figure is $1,660,055 covering revenue from transportation for July of this year. The total operating expenses amounted to $1,299,326 in July, 1923, compared with $1,103,441 in the same month a year ago. The net revenue from railway operations was $464,848, a small decrease compared with the same month a year ago, when it was $481,354. The net income shows a considerable falling off as compared with July, 1922. In that month it was $100,892 and in July, 1923, it was $30,951. The total passengers carried in July of the current year was 40,934,203, while 36,904,425 passengers were carried in July, 1922.

Accuses Men of Blocking Bonafide Reorganization

R. Floyd Clinch, a local member of the protective committee under the reorganization plan of the Chicago Elevated Railway, made a statement in answer to the announcement that the Chicago Elevated Railways preferred stockholders' committee threatened legal action against the proposed plan submitted by the noteholders' protective committee.

Mr. Clinch said that the stockholders' list showed only three of the preferred stockholders' committee as being stockholders; that two of these three acquired their stock within the last three months and at a time when it was generally known that the reorganization was under way and also that the company's finances, generally, were in bad shape and that the preferred stock had little or no value.

Further that the oldest stockholder of this so-called committee purchased his stock beginning in March, 1922, and even at that time the financial condition of the companies was generally known and reflected by the market. These gentlemen, he said, all told, own only about 2,600 shares, which were mostly purchased at a time when the market was at a nominal figure and probably $3 or less a share. It was his opinion that these men were now trying to block a bonafide reorganization which was in the interest of the properties and public alike.

It will be recalled that the time for making deposits under the terms of the reorganization has been extended.

Charleston Interurban Acquires Kanawha Valley

The entire common capital stock of the Kanawha Valley Traction Company has been acquired by the Charleston Interurban Railroad. Announcement to this effect has been made by Robert Garrett & Sons, Baltimore, who handled the transaction. Five thousand shares of a par value of $100 were involved.

The Charleston company has heretofore leased the properties of the Kanawha Valley Traction Company, comprising the railway system in the city of Charleston, W. Va., and the interurban lines connecting therewith a number of towns and villages in the surrounding territory of Kanawha County, under a ninety-nine-year lease with a privilege of purchase.

The steady growth in the business of the company and the plans for further development in the future have made it advisable and advantageous for the company to acquire the above-mentioned stock, so that it will be sole owner as well as operator of the property.

The plans contemplate an extension of its lines to serve a section which is well developed beyond its present radius. Provision is also made for necessary funds through a sale to patrons and employees of a new issue of preferred stock. This will give the company the benefit of closer financial relations with the communities which it serves and at the same time increase the security behind the bonds.

The earnings of the company for the six months ended June 30, 1923, which have recently been reported, show:

Gross receipts	$489,564
Operating expenses and taxes	339,327
Gross income	$150,237
Bond interest	59,102

Refuses Purchase Price for Rate-Making Purposes

The Missouri Public Service Commission on Aug. 8 declined to accept the purchase price of a public utility as a fair valuation for rate-making purposes. This decision was in the case of the purchase by the Public Service Company of Missouri from the Watts Engineering Company of the gas plant and property at Columbia, Mo. The purchase price of $130,000 was approved conditioned upon the purchasing company amortizing within twenty years out of its earnings the excess of $16,000 of the purchase price above the commission's rate-making valuation of $114,000. The order specifically stated that the commission would not consider the purchase price as a rate-making basis, or as acquiescence by the commission in the value placed upon the property in the present transaction and that nothing in the order shall be construed as an approval of the rates now charged for service at Columbia nor as a finding that the present rates are not excessive and not discriminatory. Consumers at Columbia had complained to the commission that the amount paid for the utility was too high and might be urged later as a basis for increased gas rates.

New Company to Take Over Doherty Colorado Properties

The Cities Service Company, New York, N. Y., H. L. Doherty & Company fiscal agents, has organized a new company, the Public Service Company of Colorado, to acquire through an exchange of stock the Denver Gas & Electric Light Company of Denver, the Western Light & Power Company of Boulder and a new power plant development at Valmount, Col. The merger plans parallel in some ways a consolidation two years ago of nine public utilities in Ohio under the name of the Ohio Public Service Company.

The Colorado merger plans provide for financing the completion of the big plant at Valmount, which is designed for an ultimate capacity of 200,000 kw., and for joining the Denver and Boulder properties with high-tension transmission lines. An Eastern group of bankers has underwritten the financial requirements. The capitalization will consist of $3,500,000 of 7 per cent preferred stock and $15,000,000 of common stock.

Holders of the Denver Gas & Electric Light Company have received a letter as to the terms of stock exchange. The 6 per cent cumulative preferred stock of that company will be exchanged on a share for share basis for the 7 per cent preferred stock of the new company. Western Light & Power Company 7 per cent cumulative preferred stock will be exchanged share for share plus par in the new preferred stock for cumulative dividends on the old stock. The Western Light & Power Company, with operating offices at Boulder, runs the local railway there.

Auction Sales in New York.—At the public auction rooms in New York there were no sales of electric railway securities this week.

Acquires Property.—The Milwaukee Electric Railway & Light Company has acquired the electric lighting and power interests of the Honey Creek Electric Light Company.

Mortgage Gold Bonds Being Offered.—Bonbright & Company are offering at 96½ and accrued interest to yield more than 6.25 per cent $1,000,000 of United Light & Railways Company first lien and consolidated mortgage gold bonds known as Series "A" 6 per cent. The bonds are dated April 1, 1922, and are due April 1, 1952.

Utilities Consolidate.—The stockholders of the Central Illinois Public Service Company, a subsidiary of the Midvale West Utilities, in a special meeting held at Springfield voted for the resolution to consolidate the Middle West Power Company and other corporations with the Central Public Service Company, etc. At the same time a meeting in Chicago of the stockholders of the Middle West Power Company, another Middle West subsidiary, voted for the resolution to consolidate.

Reorganization Postponed.—Another postponement in the proposed reorganization of the Pittsburgh Railway has been recently announced. With the permission of the Pennsylvania Public Service Commission, the date for carrying out the proposed reorganization has been set for Oct. 15. There had recently been a postponement until Sept. 1. The postponement was granted on the petition of the Philadelphia Company, which is undertaking the reorganization. It was agreed to by the city of Pittsburgh, which is a party to the proposed railways reorganization plan.

Gold Bonds Offered.—A syndicate including Dillon, Read & Company, New York, is offering at 98½ and interest, to yield more than 6.10 per cent, $10,000,000 of the 6 per cent refunding and first mortgage gold bonds, series C, of the Milwaukee Electric Railway & Light Company. The bonds are dated June 1, 1921, and are due Sept. 1, 1953. The purpose of the issue is to retire $3,600,000 of five-year 7 per cent notes due in November and to reimburse the corporation for expenditures for additions to the property. The bonds are secured by a first lien on the company's property.

On the Way to Resuming Service.—The name of the Bryan College Interurban Railway, Bryan, Tex., has been changed to the Bryan Traction Company. The stockholders of the company recently met for the purpose of organization. Work will very shortly get under way looking toward the resumption of operation. The following board of directors was elected: F. C. Bolton, James Sullivan, W. Wipprecht, E. H. Edge, J. M. Gordon, John M. Lawrence, J. Webb Howell, E. H. Astin and George Chance. The directors met and elected officers as follows: E. H. Edge, president; E. H. Astin, vice-president; James Sullivan, secretary, and J. M. Gordon, treasurer. Todd A. White has been selected manager of the property.

Long Island Line May Resume Service.—Following a conference at which were present representatives of the city, receivers and bondholders of the North Shore Traction Company, Judge Inch announced that he would enter an order directing that the work of dismantling the line be stopped. It is now probable that service on the abandoned lines in Flushing, Whitestone, Bayside, Douglaston and Little Neck will be restored. Judge Inch, in his chambers in the Federal Building, Brooklyn, at the conference on Aug. 23 suggested a plan calling for operation while a special master to be appointed by him would try to reconcile the claims and counter claims of interested parties. Vincent Victory, representing the city at the hearing, said that after a tour of inspection which he had made along the line, he thought service could be started within three weeks.

Traffic and Transportation

Election Rules Jitneys Out of Birmingham

Jitneys were virtually voted out of existence in the city of Birmingham, Ala., by a majority of 6,175 at an initiative election on Aug. 28, when the jitney men's ordinance submitted as a substitute for the city's jitney regulations was defeated overwhelmingly. Canvass of the election returns on Aug. 29 by the Birmingham Election Commission showed that the vote in favor of the jitney men's ordinance was 2,827. The vote against the ordinance was 9,002. The total vote cast was a light one.

As a result jitneys probably will cease operations on Sept. 15 and reductions of cash fares to 7 cents and ticket fares to 6 cents probably will be put into effect by the Birmingham Railway, Light & Power Company immediately after that date. In fact, preparations for taking off the jitneys and reducing car fares are now being made.

At a meeting of the Birmingham Jitney Owners' and Drivers' Association, which obtained the injunction now pending and submitted the ordinance on which the initiative election was held, it was decided to abide by the results of the election and cease operations. The meeting of the association was held on the night of Aug. 29, following the official canvass of the returns. James Weatherly, attorney for the jitney men, advised the city attorney's office of the decision on the morning of Aug. 30 and stated that he would join with the city in asking the Alabama Supreme Court to dissolve the injunction, now in force, on Sept. 15.

J. S. Pevear, co-receiver of the Birmingham Railway, Light & Power Company, stated that a new schedule of rates carrying into effect the reductions will be made up and as soon as the injunction has been dissolved and the city's regulations put into effect the company will ask the approval of the Public Service Commission for the new rates.

Judge W. I. Grubb of the United States District Court, following the election, approved the order for the purchase of twenty new cars, which were contracted for by the company some months ago.

Clause Fixing Ten-Cent Rate in Youngstown Asked

A request that the Council of Youngstown, Ohio, fix fare rate J, providing for a 10-cent fare on the Youngstown Municipal Railway, was made in a letter sent to the Council recently by G. T. Seely, president of the Pennsylvania-Ohio Electric Company.

The request is made, according to Mr. Seely, in accordance with section 14 of the franchise which provides that Council shall fix two higher schedules than the one in effect.

Schedule H, providing for an 8-cent fare, is now in effect; Schedule I, providing for a 9-cent fare, is provided for by ordinance of Council, but Schedule J has never been provided for. The Council in 1920 disregarded a similar request. It is said that the present request is merely preparatory in nature, there being no intention of involving the 10-cent rate at present.

The deficit to the stabilizing fund of the railway passed the $1,000,000 mark, the annual report for July showed.

Local Five-Cent Fares Popular on Boston "L"

Many very interesting facts regarding the Boston Elevated Railway were brought out by Edward Dana, manager of the road, at the hearing on wages for the employees, concluded recently. In speaking of the success of the 5-cent fare now in effect, Mr. Dana said that 100,000,000 a year ride on 5-cent lines. The Elevated lost 25,000,000 riders, he said, on these lines when the fare was raised from 8 to 10 cents. The 5-cent riders represent one-fourth of the entire traffic. Their average ride is 1 mile. He said that the universal 5-cent fare formerly in effect was a false economic basis.

The total investment in the Elevated system, Mr. Dana testified, is $143,000,000, of which $52,000,000 represents stock, $46,000,000 bonds and $45,000,000 state and city bonds on the subways and tunnels.

He said that it had taken a number of years to bring wages up to 48 cents an hour, under the old 5-cent fare. Since the establishment of a sound economic basis, the wages have increased from $9,000,000 to more than $15,000,000. The item for wages is now more than the entire operating expenses of the road in 1918.

The depreciation allowance since 1919 has been $2,000,000 a year, whereas it was only $352,000 before public control and the 10-cent fare.

Mr. Dana gave computations as to the number of day's receipts required to pay the various charges in the operations of the system, as follow: 161 days required to meet the payroll; 39 days to pay for the cost of materials, 34.5 days for the return on $52,000,000 of stock; 25 days for interest on bonds, 22 days for fuel; 22 days for interest on state and city funds; 22 days for depreciation, 19 days for Federal, state and municipal taxation; 12½ days to pay back the deficit to cities and towns.

Mr. Dana said that an increase in wages must come out of the amount which ordinarily could be applied toward reducing the 1919 deficit of $5,415,500. If wages should require more than that amount, it would mean an increase in fare temporarily.

United States Supreme Court to Decide Shreveport Fares

The Shreveport Railways is operating under the 7-cent fare as ordered by the court. Three years have passed since the fare agitation started in Shreveport. The matter is still not settled. In 1920, by a vote of the people, the Shreveport Railways was granted an increase in its fare from 5 cents to 6 cents. The election was contested by Huey P. Long, chairman of the Louisiana Railway Commission, acting as a citizen of Shreveport. The State Supreme Court upheld it.

In 1921 the State Constitutional Convention changed the name of the Railroad Commission to the Public Service Commission and gave the Public Service Commission authority to fix rates to be charged by public service utilities. In April, 1922, the Public Service Commission issued an order, without a hearing, fixing the street car fare in Shreveport at 5 cents. After an appraisal of the property had been made by valuation engineers, the Public Service Commission granted a hearing on the application of the company for an increase in fare Jan. 15 and 16, 1923, at which evidence was introduced on both sides on the question. but the commission failed to make a decision. The company appealed to the United States District Court and secured a temporary injunction against the Louisiana Public Service Commission, restraining that body from interfering with the company's collecting a 7-cent fare.

Huey P. Long, chairman of the commission, then sought and was granted an appeal to the United States Supreme Court. He based his appeal on the plea that the Federal District Court was without jurisdiction.

Milwaukee Company Defines Its Use of the Bus

Be not the first by whom the new are tried,
Nor yet the last to lay the old aside.

This advice of Pope the Milwaukee Electric Railway & Light Company has followed. The company is progressive but particular. So that its owners may know, the company inclosed with the dividend check to the holders of its preferred stock accompanying the payment made on Sept. 1 a statement reviewing its affairs. In this statement it contrasted the ten-year growth of the company business from a gross of $7,729,822 in 1912 to $19,493,012 in 1922, a gain of more than 152 per cent. Many other facts were given. The outlook for the future was pronounced to be most promising. On just one matter, the bus, holders of the company's securities are reassured as follows:

During the past two years your company has added a large fleet of passenger motor buses to its street railway branch. These buses co-operate with the street cars in carrying city passengers, and they supply new travel routes between Milwaukee and scores of cities and towns in the Milwaukee trade territory throughout southeastern Wisconsin.

Your company has always been a leader in inventing or adopting new machinery to get each job done with the fewest necessary men working under humane conditions.

Hyde Park Service Started by Boston Elevated

An arrangement has been completed whereby the Boston Elevated Railway has taken over a part of the Eastern Massachusetts Street Railway system in Hyde Park, a community annexed to Boston some years ago. The Boston Elevated began service over the line on Sept. 1, which has the effect of giving Hyde Park a 10-cent fare to Boston.

The sole purpose of this arrangement was to provide a single fare for Hyde Park, which has fought for it for twenty years. It wanted a 5-cent fare when that was the unit, and its principal reason for seeking annexation to Boston was to obtain the single fare.

In order to accomplish the change the city of Boston acquired a section of the Eastern Massachusetts system and leased it to the Boston Elevated, as it leases the subways and tunnels to the Elevated. Not only does the Elevated run its own cars to the center of Hyde Park, but it has established two lines of buses to other sections of Hyde Park and to Readeville, giving the privilege of transfer from one to the other. The fare unit on the jitneys for the present is 10 cents. So elated are the people of Hyde Park over the change that they had a public celebration on the evening before the new service went into effect and entertained Mayor Curley of Boston, other city officials and the trustees and officers of the Boston Elevated.

Co-operating in Toledo for Safety

Toledo utilities are co-operating in a city-wide campaign for safety. Results already include a new traffic code, plans for a safety week, Sept. 23 to 30, anti-jay-walking campaign, motor drivers' school and a complete industrial and school campaign for the entire year.

The Toledo Safety Council has been organized and is headed by V. J. Waltz, claims attorney for the Community Traction Company, as president. Ray Metzger, manager of the Toledo, Ottawa Beach & Northern Railway, is chairman of the public utility committee. H. E. Brosius has been hired as secretary-manager of the council. He has established offices at 1734 Nicholas Building.

The Toledo Automobile Club has appropriated $5,000 for the printing and distribution of a pamphlet containing the new traffic code, state motor laws and digest of important traffic rules.

May Adopt New P.A.Y.E. Cars in Duluth

As a result of a mild rebellion which has developed among the patrons of the Duluth Street Railway on its West Duluth and Aerial Bridge lines against the use of the turnstile in connection with the pay-as-you-enter-cars, officials of the company in conference with city officials have suggested a way out of the difficulty by abolishing the turnstiles and having a front-end exit.

Herbert Warren, vice-president and general manager of the company, told city commissioners at the conference that the company now desired to make the change and had already made plans to convert ten cars into this type, if the sanction of the City Council could be obtained. An agreement has not yet been reached by the city officials.

For the past week patrons of the line on which the turnstiles have been in operation have taken concerted action in refusing to pass through them. No serious trouble, however, has resulted and the incident has merely served to cause the company officials to confer with the City Council with reference to the adoption of a new type of pay-as-you-enter cars.

Seeks to Use One-Man Cars.—Application has been made to the Wisconsin Railroad Commission by the Wisconsin Public Service Corporation to introduce the one man car between Kaukauna and Green Bay.

New Rates Filed.—The Pittsburg & Beaver Street Railway, Pittsburgh, has filed a new tariff of rates with the Public Service Commission effective Sept. 17. The tariff increases the fare between Sixth Street, Ambridge, and Station Street, Leetsdale, from 5 cents a round trip to 5 cents each way.

Bible Students Break Pass Records.—During the week ended Aug. 19, the Tacoma Railway & Power Company reached the record total sale of 12,512 dollar weekly passes compared with a sale of 8,400 in the same week (Pass No. 4) of last year. The record was attained through the patronage of 500 delegates to the International Bible Students Association.

Will Protest Bus Competition.—The Levis County Railway, Levis, Que., is protesting against the alleged illegitimate competition of motor buses. A ruling was recently handed down by the Public Service Commission asking the city of Levis to co-operate with the electric railway so as to assure fair returns to that company and to take means, if necessary, to prevent undue competition from auto bus owners.

Interurban to Run Buses.—The Chicago, Ottawa & Peoria Railway, included in the Illinois Traction System, has been authorized by the Illinois Commerce Commission to abandon operation of 3½ miles of track between Hick's Junction and the village of Ladd, contingent upon the company arranging to supply adequate service by bus between Spring Valley and Ladd. It has already agreed to do this.

Must Continue Safety Practice.—Motormen or conductors on the Wisconsin Public Service Corporation line operating between Kaukauna and Green Bay must flag their cars across a number of steam line tracks, according to a ruling of the commission. The steam trains move slowly and are infrequently used, but the commission refused to permit discontinuance of the safety practice.

Authorizes One-Man Cars.—The Missouri Public Service Commission has authorized the use of one-man cars by the Hannibal Railway & Electric Company. A hearing was held on the company's application at Hannibal on Aug. 8. The city officials informed Public Service Commissioner E. J. Kean, who conducted the hearing, that there was no objection to the cars provided they received and discharged passengers on the right side. The order permitting the use of the cars issued on Aug. 14 makes this requirement.

Wants More Cars Operated. — The City Council of Buffalo has asked the Public Service Commission to direct the International Railway to operate more cars and under shorter headway on the local lines in Buffalo. Figures compiled by the municipal authorities indicate that approximately 440 cars, not including interurban cars, are being operated in Buffalo during the rush hours between 4:30 and 6:30 p.m. Two years ago, the figures show, the International was operating 805 cars, with 925 in 1921 and more than 1,200 in 1913 and 1914.

Rerouting Plan Rejected. — After a discussion in which neither the Davenport City Council nor Manager R. J. Smith of the Tri-City Railway would agree on the proposed rerouting plan for the city, the Council rejected the plan in toto. Previous to the rejection Manager Smith proposed to introduce two bus feeder lines tapping the districts east and west of Vander Veer Park and to agree to allow the Thirteenth Street-Grand Avenue line to remain as it is now, to extend the Rockingham line to the city limits and to extend the Northwest line from Division Street out to Lombard.

Buses Make Connection.—A new bus line started operation on Aug. 1 which connects southeast and southwest Washington. The line is operated jointly by the Capital Traction Company and the Washington Railway & Electric Company. Two buses are operated, giving a twelve-minute service each way. The fare is 8 cents cash, six tokens for 40 cents, with a 2-cent transfer charge to or from electric railway cars at points where the buses connect with various lines of the Capital Traction Company or of the Washington Railway & Electric Company.

Extends Service.—The United Traction Company, in keeping pace with the development of Albany, which has recently annexed a portion of the town of Colonie, has extended its service over its West City line route a distance of 0.65 mile to the city boundaries, which adds 1.3 miles to the trackage of the traction company. This territory had been served by the interurban cars of the Schenectady Railway and the residents of the section are now given a much better service with the payment of but one regular city fare. The first car was run over the extended route on Aug. 27 and was driven by Mayor Hackett of Albany.

Perfecting Plans for Bus Operation.—Plans are being perfected by the Boston Elevated Railway management under which practically all the trolley lines will be eliminated in Malden, Mass. Motor buses will replace them. Tracks will be ripped up and streets repaved. This action is expected to relieve traffic congestion. A bus terminal will be placed on land owned by the road at Main and Center Streets, from which two-car and three-car trains will be operated from the bus terminal to the Everett terminal of the elevated structure.

Transfer System Changed.—The present system of transfer will be simplified on the lines of the Los Angeles Railway by making it necessary for conductors to carry only two kinds of transfers instead of four. The new plan will be introduced within the next two months. One of the important features of the new plan is that the transfers will have p.m. coupons. Transfers issued in the a.m. period will be torn off the pad, so as to leave the p.m. coupon on the stub. This will eliminate the necessity of carrying a.m. and p.m. transfers. Another feature of the new transfer is that characters will be substituted for dates. In this way fraud can be easily detected.

Bonus for Car Men Under Safety Plan.—Under the safety plan of the Memphis Street Railway, which went into effect two months ago, earnings of platform employees for the month of July totaled $2,721. This brings the total for the two months up to $4,927, or a bonus of $9.36 for each platform man for the two months. The bonus is distributed every three months, and with the first distribution being made in September the bonus for each employee at the present ratio will amount to about $14. The plan was adopted by the company as a measure of safety, the company agreeing with its men to share with them the amount saved by avoiding accidents.

Serving Injunctions on Jitney Operators.—The Schenectady Railway has commenced the service of copies of restraining injunctions on jitney drivers in an effort to drive them off the streets of the city. Service has been had on about forty operators who are summoned to appear in the Supreme Court on Sept. 10 and show cause why they should not be in contempt for failure to abide by the injunction order restraining them from operating. Papers are being prepared for the service of about sixty additional operators. If such procedure does not have the salutary effect desired, the company will proceed to gather evidence against several hundred other operators and serve them as rapidly as possible.

Express Service Provided.—In accordance with the "public be pleased" policy of the Brooklyn-Manhattan Transit Company, Brooklyn, N. Y., passengers on the stations from Ocean Parkway to Parkside Avenue voted, on Aug. 30, to determine the new schedule of trains on the Brighton Beach Line. More than two-thirds of the patrons voted, the figures showing 21,692 votes by 31,919 passengers on the Brighton line. Plan No. 1, which provides for express service from Brighton Beach, by way of Manhattan Bridge, to Forty-second Street, with local service from Coney Island and Brighton Beach, via the Montague Street tunnel, to Fifty-seventh Street won by a plurality of 3,186 votes. The new schedule will go into effect on Oct. 1.

May Class Buses as Public Utilities.—A public hearing will be given by the Massachusetts Department of Public Works on Sept. 12 at Boston on the question of placing jitneys, buses and motor trucks under the provisions of law classifying them as "public utilities." Under such classification they will not be permitted to operate anywhere within the state before the public authorities declare that "public convenience and necessity required" that the specific service be performed. The plan would virtually place the buses and jitneys in the same class with street railways and steam railroads for the purpose of regulation, and the Department of Public Utilities probably would be empowered to regulate fares and schedules.

Book Reviews

Properties of Chilled Iron Car Wheels

Part I—Wheel Fit and Static Load Strains; Bulletin 129.
Part II—Wheel Fit, Static Load and Flange Pressure Strains, Ultimate Strength of Flange; Bulletin 134.
Part III—Strains Due to Brake Application, Co-efficient of Friction and Brake-Shoe Wear; Bulletin 135.
By J. M. Snodgrass, professor of railway mechanical engineering, University of Illinois, and F. H. Guldner, special investigator. Published by the Engineering Experiment Station of the University of Illinois, Urbana, Ill.

These three bulletins of the Engineering Experiment Station of the University of Illinois are the result of a three-year investigation of properties of cast-iron car wheels, made under the direction of the Railway Engineering Department of the University, in collaboration with the Association of Manufacturers of Chilled Iron Car Wheels. Investigation of the strength of wheels has been made with a view toward improving the design and increasing the safety of cast-iron car wheels. Particular attention has been paid to testing the flanges of the wheels, as breakage at this point is extremely serious.

The program adopted by the committee was embraced to determine (1) the strains caused by mounting the wheel on its axle; (2) the strains caused by the static or wheel loads; (3) the ultimate breaking strength of flanges, and strains caused by flange pressure; (4) the strains due to temperature gradients in the wheel caused by brake application; (5) incidental problems related to the above.

Part I deals principally with strains due to mounting the wheel on the axle, while Part II, in addition to giving further information on this subject, covers the effect of different thicknesses of flange on the strength, and also shows the effect of wear on the wheel flanges on their strength. The general conclusion from the results of these tests is that the flange strength of the chilled iron wheel can be increased to keep pace with probable future service requirements by a proper placing of additional metal in the tread and flange.

Part III deals principally with tests of friction and wear of brake-shoes applied to chilled iron wheels and, for comparative purposes, to steel wheels, rotating at constant speed. Temperature changes due to brake-shoe pressure were very carefully determined. The principal conclusion was that the stresses in chilled iron wheels, set up by temperature gradients due to brake application, are transmitted mainly through the outer plate, the strains or stresses on the inner plates being relatively small. The stresses resulting from temperature gradients may be kept within safe limits by the use of cooling periods or cooling stations. The so-called "arch-plate" design gives better service results than the M. C. B. type, due to better placing of the material.

Prolonged and excessively heavy brake application may cause strains of sufficient intensity to crack either chilled iron or steel wheels. This emphasizes the necessity for careful attention to operating conditions of breaking apparatus in both level and mountainous regions.

Proceedings of the Eighteenth Convention of the Union Internationale de Tramways

The report of the proceedings, held in Brussels, Oct. 2-7, 1922, has just appeared in a volume of 482 pages. They contain the papers and discussions, together with a brief account of the social events. The latter are illustrated by views of the places visited.

Explosives, Their Materials, Constitution and Analysis

By C. A. Taylor and Wm. H. Rinkenbach. Bulletin 219, United States Bureau of Mines, Washington, D. C.

This is a comprehensive, well-indexed book of 188 pages, covering in a thorough manner the properties and analysis of materials used in explosives, and full information regarding the explosives themselves. It will be useful to electric railway engineers who are responsible for blasting operations.

Personal Items

Mr. Banghart in New York

Former Augusta-Aiken Official Made Vice-President of Staten Island Properties

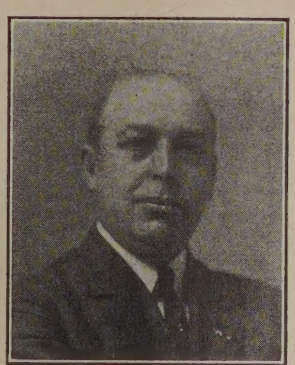
Charles S. Banghart has resigned as general manager of the Augusta-Aiken Railway & Electric Company, Augusta, Ga., to accept the position of vice-president of the Staten Island Edison Company and the Richmond Light & Railroad Company, with offices in St. George, Staten Island, New York City. All of these properties are under the management of the J. G. White Management Corporation. Mr. Banghart will be succeeded at Augusta by F. Bayard Culley, who has been assistant secretary and treasurer there. Mr. Culley will in turn be succeeded by M. H. Hendee, commercial manager and purchasing agent at Augusta.

This formal announcement means, of course, that Mr. Banghart is coming back to New York to live. And that means a great deal to Mr. Banghart's many friends in the Metropolitan district. Augusta's expressed regret at losing Mr. Banghart is sincere, but Augusta's loss is indeed New York's gain. Mr. Banghart looms large wherever men gather.

A Factor in Public Affairs

If ever praise was heaped—yes, heaped, that's the only word—upon a man by the daily press of the city he was about to leave that man is Charlie Banghart. Augusta took Mr. Banghart to itself at once. There is probably no gift within the power of the people of that city to bestow which Mr. Banghart could not have had at a mere hint of desire from him. While Mr. Banghart did enter actively into civic affairs and the social life of the community, business reasons made it necessary for him to decline some of the honors which Augusta in fact sought to bestow upon him. Of the Rotary Club he was one of the most active members. Last year he was tendered the presidency of that organization, but had to decline. The Augusta *Herald* said of Mr. Banghart that he is a technician without pedantry; a street railway manager without enemies; a disciplinarian without harshness; a humorist without cynicism; a leader without egotism, and a man without guile. Praise, indeed, but not too much. So much for the man. Of his work the Augusta *Chronicle* said that "he found the local system in bad condition and has built it up in efficiency and in the esteem of the people and it can be stated without any exaggeration that the Augusta-Aiken Railway & Electric Company is in better standing with the people of the community than in many years, and a large part of this improved esteem is due to Charles S. Banghart."

Mr. Banghart went to Augusta in 1919. He has been engaged in electric railway work since 1892, being connected in turn since that time with the Thomson-Houston Company, the Union Traction Company, Reading, the New York & Queens County Railway and the Binghamton Street Railway. The properties on Staten Island with which he now has become connected are the successors after reorganization of the Richmond Light & Railroad Company. The White interests bought into them some time ago, and under the reorganization the lighting and railroad properties have been segregated. Of all the boroughs of Greater New York the borough of Richmond, in which Staten Island is located, has, on account of its somewhat isolated position, been the last to feel the impetus of the growth of the greater city, but with the prospect of its connection by tunnel with the rest of the city, great expansion appears to be ahead of it in the next few years. The White interests are planning for this, and in the work of rehabilitating the properties there and expanding them Mr. Banghart will undoubtedly be called upon to play a large part under the direction of President J. H. Pardee.



C. S. Banghart

R. L. Rand, formerly vice-president and manager of the Richmond Light & Railroad Company, will continue with the successor company in the capacity of general manager. He has been connected with the properties for a long time.

Mr. Queeney Appointed Assistant to Mr. Mitten

J. A. Queeney, for many years special representative of the railway department of the General Electric Company at Schenectady, has resigned from that concern to accept the position of assistant to T. E. Mitten, chairman of the board of the Philadelphia Rapid Transit Company.

C. S. MacCalla at Youngstown

Made Vice-President and General Manager of Pennsylvania-Ohio Electric Company

C. S. MacCalla has been made vice-president and general manager of the Pennsylvania-Ohio Electric Company and the Youngstown Municipal Railway and other subsidiaries of the Pennsylvania-Ohio System operating city railway lines in and interurban lines between Youngstown and Warren, Ohio, and Sharon and New Castle, Pa. He assumed the duties of these offices on Sept. 1, succeeding Garrett T. Seely.

Mr. MacCalla brings to his new field of activity a wide and varied experience in public utility operation, both in the railway and the light and power divisions of the electrical industry. He was born in Wallingford, Pa., in 1876. Immediately upon leaving Lehigh University, where he was graduated in 1896, Mr. MacCalla began his work with public utilities, spending brief periods in the installation department of the Philadelphia Bell Telephone Company and as a "trouble shooter" for the Edison Electric Light Company, Philadelphia, now the Philadelphia Electric Company. Then followed four years with the Edison Electric Illuminating Company of Brooklyn (Brooklyn Edison Company) successively as draftsman, construction boss and general construction foreman.

Active electric railway experience began in 1901 when Mr. MacCalla joined the foreign department of the General Electric Company as principal assistant engineer in charge of the installation and initial operation of the Sydney, Australia, tramways system for the New South Wales government, the work including the installation of the steam-electric generating plant, substations and railway equipment, the system being the then largest three-phase transmission plant south of the equator.

In 1903 Mr. MacCalla went to the Pacific Coast, where he was identified with the Washington Water Power Company, Spokane, Wash., for fifteen years, successively as assistant to the general manager, assistant general manager, general manager and vice-president and general manager, continuing in the last named position for five years, and having full charge of operations, both power and railway, in Spokane and some thirty-odd smaller cities and towns within a radius of 100 miles. He equipped the Spokane city railways with one-man Birney safety cars, the installation being the first in any city of more than 100,000 population.

Returning to the east, Mr. MacCalla was elected vice-president and general manager of the Virginian Power Company, Charleston, W. Va., which position he recently resigned.

During his residence in West Virginia he was appointed by the Governor

to the state board for registration of engineers and as a delegate to represent the State at the water power conference in New York in February, 1922.

Mr. MacCalla is a member of the American Society of Civil Engineers and a fellow of the American Institute of Electrical Engineers, being active in both organizations.

G. T. Seely Resigns from Youngstown Companies

Garrett T. Seely has resigned as vice-president and general manager of the Pennsylvania-Ohio Electric Company and the Youngstown Municipal Railway, Youngstown, Ohio. Mr. Seely succeeded Richard T. Sullivan with the properties at Youngstown in 1919. Previous to that time he was assistant general manager of the several elevated railways in Chicago. Coming from work in the steam railway field, his first connection in electric railway work was as engineer maintenance of way of the South Side Elevated Railroad, Chicago. He was subsequently advanced to the position of vice-president and general manager of this company. When the four elevated railways in Chicago were consolidated in 1911 as to operation and management he was made assistant general manager of the combined system. He remained in this capacity until 1919, when he went to Youngstown.

Mr. Seely was graduated from the University of Illinois in civil engineering in 1899. At the meeting of the American Electric Railway Association last fall Mr. Seely was elected president of the Transportation & Traffic Association. He has always been active and interested in sectional and national association work and previous to his election as president of the Traffic Association held important offices in the Illinois Electric Railway Association, the Central Electric Railway Association and National Electric Light Association. He has been one of the most progressive among railway men in adopting the bus as an additional transportation tool, and also in devising ways of better merchandising of the transportation services.

New Manager Named at Augusta

F. Bayard Culley, assistant secretary and treasurer of the Augusta-Aiken Railway & Electric Corporation, has been appointed general manager of the company to succeed Charles S. Banghart, appointed to the Staten Island Electric Company, as noted elsewhere in this issue. Mr. Culley is an Augustan. He has been with the Augusta-Aiken since 1907, and has won promotion after promotion until he has now earned a position which places him in charge of the property. He has worked in the closest touch with Mr. Banghart and is particularly well qualified to take over the general managership. Mr. Culley is a Virginian by birth and lived for a while in South Carolina, but Augusta has been his home for many years.

N. H. Brown at Alliance

Former Buffalo Executive Made General Manager of Stark Electric Railroad

Nelson H. Brown has been appointed general manager of the Stark Electric Railroad, Alliance, Ohio, a high-speed line operating between Canton and Salem, Ohio. Prior to accepting appointment to the company at Alliance, Mr. Brown was general manager of the Buffalo & Lackawanna Traction Company and the general manager of the Depew & Lancaster Railway Corporation, Buffalo, N. Y., for two and a half years.

After many years of service in steam and electric railway work, including connections with the New York Central Railroad, the Syracuse Rapid Transit Railway, the Worcester Consolidated Street Railway and the Albany Southern Railroad, among others, Mr. Brown

N. H. Brown

in January, 1913, accepted the position of assistant superintendent of transportation of the International Railway, Buffalo, N. Y., realizing the broader field of opportunity which the position with that company opened to him. On June 1 of the same year he was promoted to the position of superintendent of transportation of the Buffalo Division, and in November, 1915, was made general superintendent of the company.

In 1917 Mr. Brown was transferred from the position of superintendent of transportation at Buffalo to that of manager of the electric railway properties of the New Orleans Railway & Light Company, both of which were then subsidiaries of the United Gas & Electric Corporation. He returned to Buffalo from New Orleans in the spring of 1921 and became general manager of the Buffalo & Lackawanna Traction Company and the Depew & Lancaster Railway Corporation.

H. W. Witherspoon, general manager of the Stark Electric Railroad, Alliance, Ohio, has resigned to enter business for himself in Alliance. Mr. Witherspoon will terminate five years of active service with the railway. He was general superintendent for two years and general manager for a year and a half.

John T. Boifeuillet, Macon, Ga., has been elected vice-chairman of the Georgia Public Service Commission to succeed James A. Perry, who had served as vice-chairman of the commission for some time. Mr. Perry was deposed by the other members due to his activities before the recent session of the Georgia State Legislature, in which he advocated reduction of the commission from five to three members.

Malcolm H. Hendee has been appointed to succeed F. Bayard Culley as assistant secretary and treasurer of the Augusta-Aiken Railway & Electric Company. He is a Georgian, and came to Augusta when a very young man. He went with the Augusta-Aiken in 1908 as a stenographer. Recently he has been the commercial manager for the organization, having worked his way up step by step.

Granville Lyon, formerly connected with the securities department of the Wisconsin Power, Light & Heat Company, Madison, has been appointed manager of the newly formed utilities securities department of the Eastern Wisconsin Electric Company, Fond du Lac. He will have charge of this branch of the business in the state of Wisconsin, as well as being head of the new department.

Donald R. Keith, formerly of Lima, Ohio, has been placed in charge of the Springfield, Ohio, office of the department of public relations of the Indiana, Columbus & Eastern Traction Company, according to an announcement on Sept. 3. The appointment follows the transfer recently of Arthur V. Bland, director of the department, and his aids to Columbus. Mr. Keith will represent the department in Springfield and also will supply publicity for his district to the newspapers. M. W. Henney, who was temporarily in charge of the Springfield office, has been transferred to Dayton, where he will represent the department.

Obituary

Andrew B. Shelton, conductor on the Denver Tramway lines for more than thirty-three years, died recently after a brief illness. "Pop" Shelton, as he was affectionately called, came to Denver in 1874. He was one of the first employees of the old cable system.

Harold Wayne Arnold, who had been with the Arnold Company, engineers and constructors of Chicago, for the last seven years, died on Aug. 3 after an illness of five weeks. He was some time ago a salesman with the Sprague Electric Company and also served in that capacity with the Western Electric Company. Mr. Arnold was a native of Nebraska, but went to Arkansas in 1894, where he entered the electrical business. He was a brother of Col. Bion J. Arnold. He was forty-nine years of age.

Manufactures and the Markets

News of and for Manufacturers—Market and Trade Conditions
A Department Open to Railways and Manufacturers
for Discussion of Manufacturing and Sales Matters

Weekly Soft Coal Output Sets Record for Year

The week ended Aug. 25 showed the largest production of soft coal for any week during the present calendar year, according to reports of the United States Geological Survey. The total for the week is estimated at 11,346,000 net tons, which is an increase of 503,000 tons over the figure for the preceding week. Early returns on car loading for the week Aug. 28 to Sept. 1 indicate a further increase, with a probable total of about 11,500,000 net tons.

Bituminous production for the first 201 working days of 1923 was 357,036,000 net tons. This total is almost identical with production in 1917 and is exceeded only by that of the year 1918, which was one of abnormal activity owing to the war. Figures for the years 1919, 1920, 1921 and 1922 all fall far below those of production for the current year.

Bituminous Storage Increased

Soft coal continued to flow into storage during July, and on Aug. 1 commercial consumers had on hand approximately 51,000,000 net tons. In comparison with the figure for the first of the preceding month, this was an increase of 5,000,000 tons. Progress in the building up of stock from the low point reached on Sept. 1, 1922, owing to draft on reserve during the strike last summer, has been practically uninterrupted, and in the eleven months that have elapsed there has been a net gain of 29,000,000 tons. Stocks on Aug. 1 of this year were 10,000,000 tons in excess of those on hand a year ago. Available records show that the supply in storage on Aug. 1 this year has been exceeded only during the period at the close of the war and just prior to the miners' strike of 1922.

Measured in terms of tons, stocks increased 10.9 per cent during July. Measured in terms of days supply the increase was 18.9 per cent. The larger increase in days supply was due to the fact that the rate of consumption decreased in July, thereby increasing the length of time the tonnage on hand would last. At the rate of consumption in July, the stocks on hand Aug. 1 were sufficient to last forty-four days on the average. This average is based on the assumption that stocks were evenly divided, and as such is never the case, the figure has value only for general comparison.

Stocks are far above the average in some communities and far below in others. New England is well supplied, having over ninety days supply on hand. The Eastern seaboard generally is in good shape, the supply of bituminous on hand being sufficient for from sixty to ninety days. About the same condition prevails in the Northwest. In the Central and Southwestern states the conditions are not so good. Stocks in those regions vary from a sixty days supply down to almost nothing.

Hard Coal Stocks Low at Present Time

Anthracite stocks, on the other hand, are in very poor shape. Throughout New England and the Middle Atlantic states the retailers' stocks of hard coal on Aug. 1, 1923, ranged from 25 per cent to 50 per cent below those on hand Aug. 1, 1921, the last normal year. Conditions in the Central states were somewhat better, but in no case is any large surplus on hand. Retail dealers generally received more anthracite in July than they delivered and their total stocks on Aug. 1 were 4 per cent larger than on the first of the preceding month. These stocks, however, were much lower than during the summer of preceding years, largely because of the rapidity with which coal has been taken by the consumers. The production of anthracite in the week ended Aug. 25 established the year's high record for weekly output. The total for the week ended Sept. 1 will probably be much reduced because the collieries were shut down on Saturday and production slowed up on Friday in anticipation of the present suspension.

Fuel Oil Has Limited Possibilities as Substitute for Coal

As a result of periodic labor troubles in the mine fields and consequent coal shortages, many consumers have been tempted to replace coal burning furnaces by oil-burning apparatus. According to some oil refineries, however, this step should not be taken without careful consideration. It is likely that the economies now possible by the use of fuel oil will not continue to be possible for a period much longer than five years.

It is pointed out that the crude oil supply in the United States is strictly limited, the amount yet available being estimated at about 9,000,000,000 bbl. Of this amount 5,000,000,000 may be classed as being actually in sight and the other 4,000,000,000 bbl. as a possibility. A survey by geologists indicates that there are three principal sources of petroleum in the United States and gives the approximate quantity to be expected from each. It is thought that there are in the Gulf Coast region, including the states of Texas and Louisiana, about 2,100,000 bbl. The California oil fields should yield about 1,850,000 bbl. according to their estimate, and those in Oklahoma 1,340,000 bbl. The remainder of the 9,000,000,000 is distributed in numerous states with no very large concentration at any one point. Since the publication of the report, additional wells have been discovered in California and it now appears probable that a greater supply than was estimated will be available there.

The ordinary life of a flowing well is said to be about two years. Pumping may add one year more to the life of a well but will likewise add very considerably to the cost of the oil. It is expected that the California oil fields will be able to maintain their present output for about eighteen months more. A large production may be expected from the wells in Oklahoma and the Gulf Coast states for about two years more. The output of crude petroleum after the expiration of that time will depend largely upon the opening up of new fields in the future.

The total production of oil in the United States at the present time is not quite 500,000,000 bbl. annually. The consumption, however, is well over 500,000,000 bbl. Under these circumstances, with the total supply limited, it is evident that present low prices and abundant production will not continue indefinitely. There is, however, a possibility that the development of South American oil fields will balance the decreasing supply in the United States. At the same time refiners point out that methods of extraction are being constantly improved and there remains less residue for fuel oil. On this account any hasty decision to replace coal burning furnaces by oil-burning furnaces would seem to be unwise.

Copper Price Declines

Recent quotations give a price of copper in small quantities as low as 13⅞ cents per pound. This is a reduction of more than 2 cents per pound from the price prevailing a number of weeks ago. At this figure manufacturers say copper is selling below the actual cost of production. The particular occasion for this decline appears to be a further slackening in the foreign demand.

Metal, Coal and Material Prices

Metals—New York	Sept. 4, 1923
Copper, electrolytic, cents per lb.	13.687
Copper wire base, cents per lb.	16.50
Lead, cents per lb.	6.80
Zinc, cents per lb.	6.82
Tin, Straits, cents per lb.	41.375
Bituminous Coal, f.o.b. Mines	
Smokeless mine run, f.o.b. vessel, Hampton Roads, gross tons	$5.125
Somerset mine run, Boston, net tons	2.50
Pittsburgh mine run, Pittsburgh, net tons	2.30
Franklin, Ill., screenings, Chicago, net tons	1.80
Central, Ill., screenings, Chicago, net tons	1.425
Kansas screenings, Kansas City, net tons	2.625
Materials	
Rubber-covered wire, N. Y., No. 14, per 1,000 ft.	$7.00
Weatherproof wire base, N. Y., cents per lb.	18.75
Cement, Chicago net prices, without bags	$2.20
Linseed oil (5-bbl. lots), N. Y., per gal.	$0.91
White lead, in oil (100-lb. keg), N. Y., cents per lb.	11.375
Turpentine, (bbl. lots), N. Y., per gal.	$0.95

Track and Line

Muskegon Traction & Lighting Company has been granted permission to extend its Ottawa Street car line to Getty Avenue.

Memphis Street Railway will extend the Florida Street line 900 ft. south of the present terminus to the point intersected by the Horn Lake Road.

Toronto, Ont.—The City Council has sanctioned the payment of $5,000,000 to the Toronto Transportation Commission for the program of rehabilitation of the street railway system for 1923.

Niagara, St. Catharines & Toronto Railway has planned improvements throughout the Niagara peninsula calling for an expenditure of $2,300,000. Of this amount it is estimated about $300,000 will be used for the building of a new terminal in St. Catharines.

Charleston Consolidated Railway & Lighting Company, Charleston, S. C., will soon start work on putting in a single track on King Street between Line and Cleveland, taking the place of the present double track. The old rails will be taken up and new ones laid.

Southern Public Utilities Company, Charlotte, N. C., will construct an extension of the West Highlands line to the new city high school. The work will be pushed to completion so that the greater facilities thus presented may be supplied to the pupils in the coming session.

Tennessee Electric Power Company, Chattanooga, Tenn., is making extensive improvements to its system in the Chattanooga district. A double-track section is being laid on East Fourteenth Street and work will soon be started laying new tracks on Central Avenue, West Ninth Street and on Chestnut to Main.

Indiana Service Corporation, Fort Wayne, will receive a franchise for the laying of a double car line on Lafayette Street from Lewis Street to Wallace Street. A petition for the franchise has been under advisement since it was presented to the board some months ago. The laying of tracks on Lafayette Street will give the company another line into the southern part of the city and will eliminate some of the congestion on Calhoun Street. Under the agreement, the company agrees to bear some of the expense of constructing the subway at Lafayette Street.

San Francisco-Oakland Terminal Railways, Oakland, Cal., has just finished rebuilding a double track on North Grove Street, in Berkeley, from Berkeley Way to Hopkins Street, a distance of 4,802 ft. The cost was $92,000. The company is now engaged in one of the most expensive pieces of double-track reconstruction it has ever undertaken. The work is being done on Telegraph Avenue, from Fifty-Second Street, in Oakland, to Dwight Way, in Berkeley, a total distance of 9,733 ft. The Oakland portion of the job will cost $127,700 and the Berkeley portion $87,200.

United Railways, St. Louis, through Receiver Wells, has been authorized to spend $1,218,806 during the balance of 1923 for construction, reconstruction, repairs and maintenance of the company's properties. For buildings and alterations in shops and substations, $212,000; for substation equipment, $161,450; for bridge construction $10,000 has been set aside. Earlier in the year Judge Faris authorized expenditures totaling $1,628,455, the total for the entire year being $2,847,261. For street paving and trackwork $1,366,480 has been allotted. Most of this will be spent for reconstructing tracks.

Power Houses, Shops and Buildings

Illinois Power & Light Company, Chicago, Ill., will construct a power plant on Lake Decatur to cost $5,000,000.

Eastern Wisconsin Electric Company, Sheboygan, Wis., will construct a freight depot at the local carhouse in Fond du Lac. This will take care of service demands on account of the establishment of through interurban passenger and freight service connecting Fond du Lac, Milwaukee and Green Bay.

Wisconsin Public Service Corporation, Green Bay, Wis., has purchased the Davies Falls waterpower site on the Pike River south of Amberg, where the company proposes to add and erect another hydro-electric plant to its rapidly growing hydro-electric generation business. This company has just completed construction work on its Johnson Falls hydro-electric plant and is now actively engaged in developing another plant at Caldron Falls.

Springfield Traction Company, Springfield, Mo., is increasing the size of its carhouse by the erection of a brick and structural steel addition 81 ft. wide by 78 ft. 6 in. This addition is necessary to take care of cars and buses operated by the company. The building is being constructed by Sanderson & Porter, who are doing considerable other work in the city, and will be completed about Oct. 1. The entire cost of the addition will be in the neighborhood of $30,000.

Trade Notes

Hoggson & Pettis Manufacturing Company, New Haven, Conn., has acquired by purchase the assets, good will and business of the Sterling-Meaker Company. It is prepared to furnish repair parts and accessories as well as registers of this make to electric railways in the market for this type of equipment.

Uehling Instrument Company, Paterson, N. J., combustion engineers and manufacturers of steam power plant economy apparatus, including CO_2 recorders, has appointed three new Southern representatives, namely, Connor-Hudson Company, Southwestern Life Building, Dallas; Gibbens & Gordon, Inc., 532 Canal Street, New Orleans, and the Cornell Mathews Company, 10 Oak Street, Orlando, Fla. These new representatives are fully equipped to give the personal service demanded by the growing business in the Gulf States.

American Railways Equipment Company, Dayton, will locate its new plant in Springfield if citizens of that city will subscribe at least $30,000 in stock. Representatives of the company made this statement on Aug. 25 while in Springfield in an effort to interest local organizations in the proposition. The company manufactures a new type of street car fare and transfer device, demonstration of which was given before members of the Springfield Chamber of Commerce, street railway men and others recently. The machine, in one operation, distributes the money, totals the fares and issues transfers.

New Advertising Literature

Bates Expanded Steel Truss Company, Chicago, has issued a forty-nine-page pamphlet on its steel poles. The pamphlet is mainly illustrations, with some descriptive matter accompanying each picture.

Johns Pratt Company, Hartford, Conn., has just issued two attractive folders, one describing its "Noark" meter service switch for single-phase and direct-current service; the other emphasizing safety features of "Noark" fuses.

Reliance Electric & Engineering Company, Cleveland, has issued a new bulletin, No. 1014, descriptive of type "AS" Reliance adjustable speed motors of the armature shifting design. The booklet contains twenty-four pages and is illustrated.

Metal & Thermit Corporation, New York, N. Y., has issued a new Thermit rail welding pamphlet, which brings up to date the whole subject of Thermit rail welding to cover the many recent improvements in economy and efficiency. The pamphlet includes detailed instructions, accompanied by illustrations and drawings, showing steps in making the improved Thermit rail weld which has greatly reduced the cost per joint. Improved apparatus used in connection with Thermit rail welding, such as the self-luting mold box and the new lightweight double-burner preheater, which have greatly accelerated the speed of operation, is described in detail for the first time, as well as illustrations showing results of a ten years' service test of the Thermit rail weld, also rail bending and drop tests. Instructions for using Thermit for welding compromise joints, constructing frogs and crossings and repairing loose arms of mates and switches have also been included in complete form. At the end of the pamphlet is a discussion of the theory of rail joints.